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AMERICAN
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VOL. XXX. JUNE, 1916. No. 6.

OBSERVATIONS IN FORTY-TWO CASES OF PERFORATED GASTRIC AND DUODENAL ULCER.*

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NEW YORK CITY.

Of the forty-two cases of gastric and duodenal perforation reported herewith, thirty-nine were observed at the Harlem Hospital and three in private practice. Of the thirty-nine, only two were recorded as occurring before 1910, which would suggest that previous to that year the condition not infrequently escaped recognition, or that the hospital records were faultily kept. In none of the cases did the operator feel that a differentiation between gastric and duodenal ulcer before the operation was justifiable. Indeed, I am inclined to the belief that this differentiation is more likely to be the result of good luck than of good judgment.

PLACE OF RUPTURE

Most observers agree that the anterior wall of the stomach and duodenum is particularly prone to perforation, and in this series all were on the anterior wall. Moynihan reports fifteen anterior in seventeen perforation cases; Patterson, ninety-seven anterior in 112 cases; Hawkins, fifty-seven anterior in seventy-three cases.

There may be several perforations at the same time, as reported by Faura, Dirriot, and Appert, who record two cases in which there was one perforation on the anterior wall and one upon the posterior wall, occurring at the same time.

Musser says that 28.1 per cent. of all ulcers perforate. Considering the large number of healed ulcers accidentally discovered at autopsy, that never gave any symptoms, and taking into account the number of cases that heal spontaneously while under competent observation, and including my own experience, Musser's statement appears to fix the percentage of perforations much too high.

Perforation may occur at any age. Cheyne reports a case in a boy of thirteen; Marsten, in a girl of six; Bisset reports a case of gastric perforation in a child forty-five hours old. Keen and Musser report a case of perforation in a man of seventy. At the operation the process was regarded as malignant, but microscopic examination proved it to be ulcer.

In my own cases, 22 were between the ages of twenty and thirty; 1 aged nineteen; 13 between the ages of thirty and forty; 3 between the ages of forty and fifty; 2 between the ages of fifty and sixty; and 1 at sixty-eight.

There was but one case in which more than one perforation was found—Case No. 41, in which two perforations were found about half an inch apart on the anterior wall of the stomach.

PERITONITIS.

The type of peritonitis depends largely upon the stomach contents. If the perforation occurs when the stomach is empty, there will be few living organisms in the peritoneal sac, the highly acid gastric juice inhibiting bacterial growth. There may be considerable fluid in the abdominal cavity, but this is not always derived from the stomach; in some cases it is the result of the inflammation. It is variously sticky, turbid, yellow, or brown in color, and may be alkaline or neutral in reaction.

Even though the gastric contents have been distributed throughout the peritoneal cavity, the resulting peritonitis is not necessarily extensive.

Didgeon and Sargent in their work, "The Bacteriology of Peritonitis," published in 1905, explain why the peritonitis resulting from perforation of a gastric ulcer tends to be so limited and mild in character. Before the appearance of this work, very little was known about the bacteriology of this condition. Several observers claimed to show that the pneumococcus played an important rôle. Streptococci and staphlococci have been regarded as causative factors.

Didgeon and Sargent examined nine cases and in each instance isolated a strepto-diplococcus from the edge of the ulcer; in four of them the organism was found in the exudate in the peritoneum. The same organism was obtained from the pleural sac and from two local abscesses in connection with the

*Read before the Waterbury Medical Society, December 14, 1915.

stomach. They found that the strepto-diplococcus had very low pathogenic properties. For example, they never succeeded in killing guinea-pigs or mice with it. The animals were ill, but always recovered and never showed any post-mortem lesions, whether inoculated subcutaneously or intraperitoneally. These observers regarded the organism as distinct from the streptococcus pyogenes and the pneumococcus. In the only case in which the peritonitis was at all marked, with extensive intestinal distention, the colon bacillus was found in association with the strepto-diplococcus, and this was the only case which died of diffuse peritonitis.

These experiments tend to show that whether the same organism is concerned in producing the peritonitis in all cases or not, it is usually one of low virulence, and that the majority of cases of gastric perforation, if operated upon sufficiently early, should recover.

When virulent peritonitis occurs, which is sometimes the case, some organism like the colon bacillus is responsible for its onset. Perforation of the stomach or duodenum is a grave condition, and a fatal outcome occurs in almost every instance unless operative relief is afforded. I firmly believe that the only cases of perforation of the stomach which recover without operation are those of the posterior wall, which give rise to only a localized peritonitis in the lesser sac, and in which extension into the general peritoneal cavity is obviated by obliteration of the foramen of Winslow—a common occurrence in gastric or duodenal ulcers, the foramen being obliterated by protective ulcers.

DIAGNOSIS.

The differential diagnosis of acute abdominal lesions is a very difficult clinical problem, skill in which can only be obtained by long experience.

PREVIOUS HISTORY

In many cases one may elicit a history of previous disturbances of digestion—pain, nausea, and the additional vague symptomatology which usually obtain in this class of cases. However, in my forty-two cases, twelve did not give a history of digestive disturbances, making it evident that the absence of previous faulty digestion need not be regarded as a determining diagnostic factor.

SEX.

In this series there were six females and thirty-six males. Five of the females were operated upon for gastric and one for duodenal perforation. This is not in accordance with the statistics of English writers, who claim gastric perforation is more common in females. It is, however, in keeping with most of the American reports. Thus, Peck published in the *Annals of Surgery* thirteen gastric perforations—nine in males and four in females—and seventeen duodenal, all in males.

PAIN.

This is the most constant of all symptoms—always severe, knife-like in character, and, as a rule, early in the attack located in the epigastrium. I have never seen a patient with more agonizing pain than we find in perforation, if seen early. Respiration is very painful, causing a subsidence entirely of any abdominal effort. The thighs are flexed upon the abdomen, so as to relieve as much tension as possible, and the patient will make every effort to lie perfectly still.

NAUSEA.

At the Harlem Hospital we found this symptom in every case and in some it was marked.

VOMITING.

Vomiting is a common but not always a prominent symptom. In this series of forty-two cases, it was entirely absent in twelve. In these twelve, eight were gastric and four duodenal perforations.

The character as well as the quantity of the vomitus depends upon how soon after a meal the perforation occurs. If soon after a meal, the vomitus will contain particles of food. On the other hand, if the perforation occurs when the stomach is empty, the vomitus will consist principally of bile and mucus. Blood is rarely seen in cases of perforation.

Vomiting is more commonly observed in duodenal than in gastric perforation, which accords with observations in this series, for we had only one case of duodenal perforation in which there was no vomiting. This is explained by the fact that the gastric content in gastric perforation is more easily forced out through the opening into the peritoneum than up through the esophagus, while in duodenal perforation, the stomach wall being intact, the mechanical act of vomiting is not interfered with.

SHOCK.

In these cases shock was not observed, and in my opinion this symptom is of very little importance. If there be any shock, let it not act as a contra-indication for immediate operation, and, under no circumstances, defer the operation until the shock has subsided, for this is one condition in which the usual argument in this connection does not hold good—every hour of delay much increases the mortality.

LIVER DULLNESS.

The presence or absence of liver dullness has

been a very uncertain sign in my experience, and in a great measure it depends upon the amount of gas that escapes from the perforated viscus into the peritoneal cavity.

MUSCULAR RESISTANCE.

Too much cannot be said of this one constant sign. It is indeed what may easily be termed pathognomonic. In the cases of perforation which I have seen it was present to such a marked degree that there was no mistaking it. If one but sees a single case of perforation of this class and feels the abdomen, he ought to make no mistake in the diagnosis thereafter. We speak of muscular rigidity in other conditions, but there is nothing like the rigidity accompanying gastric and duodenal perforation.

Dullness of the flank has been spoken of as a symptom of value, but in these cases it has not been sufficiently marked to be of value in diagnosis.

I have not derived any aid from auscultation.

DIFFERENTIAL DIAGNOSIS.

Gastric or duodenal perforation is confused with acute appendicitis, and indeed two of these cases were sent to the hospital with the latter diagnosis. In both of these conditions one will get a history of some previous gastric disturbance. In both the onset is marked by pain, but it is differently situated; in appendicitis the pain is usually confined to the umbilicus, later shifting to the right lower quadrant of the abdomen; in perforation the pain is always in the epigastrium. Vomiting is common in both. In appendicitis there are elevation of temperature and acceleration of pulse rate, which are not found in perforation. In appendicitis the rigidity never assumes the board-like character found in perforation. If there is rigidity in appendicitis, it is found in the lower right quadrant of the abdomen.

With the beginning of general peritonitis, as occurs in both conditions if not operated upon, the differential diagnosis becomes more difficult, and when the case has reached this stage there is no doubt that the only thing to do is to operate. If the diagnosis is appendicitis, and we approach the appendix with the usual incision, and find it normal or nearly so, it is a matter of little difficulty to enlarge the incision to enable us to observe the organs in the right upper quadrant. If we find the cause of the condition, we can use the lower incision for drainage.

When the abdomen is open, the character of the abdominal contents should be a clue to the diagnosis. In perforation the fluid is usually of a light straw color with no odor, while in appendicitis we find either it serous or sero-sanguinous.

Acute cholecystitis may be mistaken for perforation. In these cases the pain is as severe as in perforation, but is usually most marked toward the right side, while in gastric perforation the pain is always closer to the midline, and the rigidity is much more marked and diffuse than in cholecystitis.

The most difficult condition to differentiate from gastric or duodenal perforation is pancreatitis, and when we consider the location of the pancreas, we can readily see why such is the case. The location of the pain may be the same and as severe in one condition as in the other, but the rigidity is not so marked in pancreatitis. Vomiting in acute pancreatitis is always more marked and is of that dark brownish material which should always put us on our guard. If the abdomen is open in pancreatitis, we find, as a rule, a larger amount of fluid, which is dark brown in color, in contrast to the fluid found in perforation. In acute pancreatitis, the patient has a bluish-gray appearance.

Mesenteric thrombosis and acute intestinal obstruction are conditions that may be mistaken for perforation. Fortunately, the former is a rare condition. Acute intestinal obstruction should be easily differentiated by the pain, which is intermittent in character, the absence of rigidity, the history of previous causes for peritoneal adhesions. etc., and the character of the vomitus.

We should content ourselves with this thought: Every case in the classes here mentioned calls for immediate operation. Thus, the diagnosis will be rapidly made and all possible help will be given. Delay in these conditions greatly jeopardizes the chances for recovery.

I do not think it is necessary in this paper to go into the differential diagnosis of such conditions as vesical, ureteral, or renal calculus, ruptured ectopic gestation, or acute pyosalpinx.

To sum up the whole question of differential diagnosis, all we have to do is to think of the pain and, above all, the board-like rigidity, for in these two symptoms we have our greatest help in arriving at the correct conclusion.

TREATMENT.

There is but one treatment for perforation, and that is immediate operation. When the abdomen is open, the question arises whether we are to excise the perforated tissue or close the hole by suture. In most cases we find a very small perforation and I can see no justification in resection. The Balfour method of cauterization I have never used.

In but one of these cases (No. 11 in the series) was there a perforation which I could not close. In this case the perforation had occurred three days before admission to the hospital. There was a hole

in the duodenum large enough to admit two fingers. The condition of this patient was such that all I could do was to pack. He died in two hours.

I have never used any of the adjacent organs to close a perforation. Downs reports a case where he closed the perforation by the use of the gall-bladder. In all of my cases, except the one mentioned, I have closed the perforation by suture, and in some instances the perforation was of sufficient size to admit the tip of my finger.

After closing the perforation, it has been my custom to cover the line of suture with a flap of omentum, and I have not seen a case where this has sloughed or given any trouble.

In many of my cases I worried as to the patency of the pylorus after closing the opening. It seemed to me that it was impossible for anything to pass through, but, much to my gratification, this did not give rise to any difficulties. In only two of my cases (No. 6 and No. 28 in the series) was it necessary to reoperate to relieve symptoms of obstruction.

In case No. 6 there was a large perforation of the duodenum, which was closed by suture. For about one month after the operation he seemed to progress very well; at the end of the second month his pain and vomiting returned, and he submitted to a second operation to relieve the obstruction. At the second operation, three months after closing the perforation, we were surprised to find no sign of a previous operation, but the pylorus was very much thickened, and it was impossible to pass a small artery clamp through it after opening the stomach. A posterior gastro-enterostomy, without clamps, was made, which was followed by an uneventful recovery. When last seen the patient was in perfect health with no sign of gastric disturbance.

In case No. 28 there was a gastric perforation of medium size; some trouble was expreienced in securing sufficient tissue around the perforation to hold the sutures. More than one inch of the contiguous tissue was used, and as the operation was just on the proximal side of the pylorus, I feared that it had been entirely obliterated. In this case I felt that a gastro-enterostomy was indicated, but the man's condition prohibited the procedure at that time. The immediate conduct of the case seemed favorable until the administration of soups and broths, about nine days after the operation, when persistent vomiting occurred. A second operation seemed indicated, but the abdominal wall had become infected where the drains were inserted, and we deemed it best to allow this to clear up before operating. For four weeks this patient suffered a great deal of pain and lost ground rapidly from lack of nourishment. Rectal feeding seemed to be of no avail, so, in spite of the pus-covered abdominal wall, a posterior gastro-enterostomy, without clamps, was done, and the patient made an uneventful recovery. Six weeks elapsed before the wounds entirely closed.

After closing the perforation, the entire abdomen should be cleaned as far as possible of the escaped contents of either the stomach or duodenum. This can be done by sponging with moist gauze. Irrigation of the abdomen should be done, in my opinion, only where there are signs of peritonitis.

Drainage of the abdomen is the next most important question. Some writers say that if operation is performed within eight or ten hours, there is no need of drainage. With this I cannot agree. I think that every case, no matter how soon operated upon, should be drained. In my cases I have always inserted a drain at the site of the perforation and one, or sometimes two, at the lower part of the abdomen—one in the region of the cecum and the other above the symphysis.

One of my cases was not drained. At the operation there was very little fluid in the peritoneal cavity, the perforation (gastric) having occurred only three hours before. The patient died. I feel that had drainage been employed a more fortunate outcome might have been obtained. Since then I have drained in all instances. I am not prone to the use of drainage—on the contrary, complete closure after abdominal section is all but a routine practice with me. But in gastric and duodenal perforation, drainage should invariably be used.

Drainage of the subphrenic spaces is very important and should always be considered, particularly in cases operated upon twelve or more hours after perforation has occurred. In my cases I have had no experience with the drainage of the subphrenic spaces, but I think that many of those supposed to have died from post-operative lung condition developed subphrenic abscesses which were not recognized.

Pneumonia is, however, one of the most serious post-operative complications, and is frequently the cause of death. Elliot cites Federman as attributing three out of a total of seven deaths to this cause. In Brummer's tabulated list of 470 cases, there were 280 deaths, seventeen from this complication. Petran reports six fatalities out of sixty-nine due to this cause.

A vital question is that of immediate gastro-enterostomy, and a very debatable one that must be heard from both sides. It is needless to take up space with all the arguments *pro* and *con*. The reader is referred to the article published by Elliot

in *Annals of Surgery,* May, 1912, which contains expressions of opinion from the leading surgeons throughout the world. Among my colleagues at the Harlem Hospital there is an equal division of opinion. I am still of the opinion that gastro-enterostomy is not a necessary factor in the successful outcome of the surgical relief of gastric and duodenal perforation.

In nearly all of my cases I felt that I had to a great extent caused (by the suturing of the perforations which were close to the pylorus) a marked constriction of this opening, and, yet, as I have already stated, in only two cases was a secondary operation necessary. There can be no question that the additional operation adds considerably to shock, and surely all will agree that the condition with which we are dealing is one that calls for the utmost care and speed. It is easy enough to say that gastro-enterostomy adds only a few minutes to the length of the operation, but, in my opinion, only one who has had great experience is in a position to accomplish the desired result in a short period of time. As to the added drainage which gastro-enterostomy affords the stomach, allowing more secure closure of the sutured perforation, it is proper to state that the patients are rarely allowed anything by mouth for from twelve to twenty-four hours, and by this time nature has made adequate repair at the line of suture and the perforation is leak-proof.

Then we come to the cure of the ulcer and the prevention of another forming. This would lead us into a lengthy debate, and I must say that this question stands today where it was years ago. I do not believe that gastro-enterostomy adds to the cure of ulcer, or prevents the formation of another one. We learn from the surgical laboratories of our large hospitals and colleges what gastro-enterostomy does while the pylorus is patent. I believe that in perforation we should get into the abdomen, close the opening, and get out with as much speed as care will permit, even with the risk of having to do a second operation, for if this becomes necessary, we will have a patient better able to withstand it.

Age	Name	Location of Ulcer	History of Gastric Trouble	Symptoms	Operation	Result
30	J. W.	Gastric	Negative	Ill 4 days before operation	Exploratory laparotomy	Died
25	K. B.	Gastric	Had 3 years	Ill 24 hours; pain, nausea, vomiting none	Perforation closed	Died
34	B. W.	Gastric	Had 8 years	Ill 2½ hours; pain, nausea, vomiting	Perforation closed	Cured
26	T. C.	Gastric	Negative	Ill 8 hours; pain, nausea, vomiting	Perforation closed	Died
28	L. S.	Gastric	Had 2 years	Ill 7 hours; pain, nausea, vomiting	Perforation closed	Cured
32	R. E.	Duodenal	Had 2 years	Ill 4 hours; pain, nausea	Perforation closed	Cured
34	M. S.	Duodenal	Had 2 years	Ill 3 hours; pain, nausea	Gastro-enterostomy	Cured
29	D. B.	Gastric	Negative	Ill 1 hour; pain, nausea	Perforation closed	Died
30	M. S.	Gastric	Had 3 years	Ill 6 hours; pain, nausea, vomiting	Perforation closed	Cured
28	R. M.	Gastric	Had 5 years	Ill 48 hours; pain, nausea, vomiting	Perforation closed	Died
50	M. McH.	Duodenal	Had 2 years	Pain, nausea, vomiting	Perforation closed	Died
35	J. K.	Gastric	Had 1 year	Ill 4 hours; pain, nausea, vomiting	Perforation closed	Cured
29	S. S.	Duodenal	Had 2 years	Ill 6 hours; pain, nausea, vomiting	Perforation closed	Cured
30	A. McL.	Gastric	Had 1 year	Ill 4 hours; pain, nausea, vomiting	Perforation closed	Died
32	W. J.	Gastric	Had 2 years	Ill 3 hours; pain, nausea, vomiting	Perforation closed	Cured
25	P. McC.	Duodenal	Had 1 year	Ill 4 hours; pain, nausea, vomiting	Perforation closed	Cured
23	A. R.	Duodenal	Negative	Ill 6 hours; pain, nausea vomiting	Perforation closed	Died
28	J. A.	Duodenal	Had 2 years	Ill 3 hours; pain, nausea, vomiting	Perforation closed	Cured
29	E. G.	Gastric	Had 2 years	Ill 6 hours; pain, nausea	Perforation closed	Cured
33	J. McD.	Duodenal	Negative	Ill 3 hours; pain, nausea, vomiting	Perforation closed	Cured
24	H. F.	Duodenal	Had 2 years	Ill 4 hours; pain, nausea, vomiting	Ulcer closed	Died
25	C. M.	Gastric		Ill 3 hours; pain, nausea, vomiting	Gastro-enterostomy	Died
25	J. E.	Gastric	Had 2 years	Ill ½ hour; pain, nausea, vomiting	Perforation closed	Died
28	M. R.	Gastric	Negative	Ill 3½ hours; pain, vomiting, shock	Perforation closed	Cured
30	H. C.	Gastric	Negative	Ill 4 hours; pain, nausea, vomiting	Perforation closed	Cured
23	R. W.	Gastric	4 or 5 months	Ill 6 hours; pain, nausea, vomiting	Perforation closed	Cured
34	T. McS.	Gastric	Had 2 years	Ill ½ hour; pain, nausea, vomiting	Perforation closed gastro-enterostomy	Cured
37	H. K.	Gastric	Negligible	Gastritis	Perforation closed	Cured
42	E. M.	Duodenal	1 year	Pain, nausea, vomiting	Exploratory laparotomy	Died
29	G. W.	Gastric	Negative	Ill 4 hours; pain, nausea, vomiting	Perforation closed	Cured
33	O. S.	Gastric	Negative	Ill 6 hours; pain, nausea, vomiting	Perforation closed	Cured
20	C. W.	Gastric	Negative	3 days prior was struck by edge of tray against abdomen; vomited day of admission	Ulcer sutured	Cured
40	E. G.	Gastric	Negative	Ill 24 hours; pain, vomiting	Ulcer closed	Died
36	J. D.	Gastric	Had 4 years	Ill 6 hours; pain, vomiting	Ulcer closed, then gastro-enterostomy was performed one month later	Cured
35	S. M.	Gastric	Had 2 years	Gastric distress 4 days previous; ill 4 hours day of admission; nausea, vomiting	Ulcer closed, gastro-enterostomy performed	Cured
56	F. M.	Gastric	Had 8 years	Ill 8 hours; pain, nausea, vomiting		Died
19	W. Y.	Gastric	No previous gastric history	Ill 1 hour; pain, nausea, vomiting	Ulcer sutured	Cured
35	E. A.	Gastric	Had 2 years	Ill 14 hours; pain, nausea, vomiting	Ulcer sutured	Cured
68	T. P.	Gastric	Had 30 years	Ill 8 hours; pain, nausea, vomiting	Ulcer sutured	Cured
27	V. J.	Gastric	Negative	Ill 4 hours; pain, nausea, vomiting	Ulcer sutured	Cured
29	E. C.	Gastric	Had 2 years	Ill 16 hours; pain, nausea, vomiting	Perforation closed	Cured
42	L. S.	Gastric	No previous gastric history	Pain, nausea, no vomiting	Perforation closed	Cured

COMPLICATIONS.

The most feared complication is subphrenic abscess. I have spoken of this above. Peritonitis is also a complication against which we have to guard. If drainage is employed, we have done all we can to prevent its occurrence.

AFTER-TREATMENT.

Our patients are always sat upright in bed after they have recovered sufficiently from the anesthetic. We have always found that patients will drain much better in this position. Nothing is given by mouth for the first twelve hours; after that the patient is allowed to chew cracked ice. Brushing the teeth and washing the mouth is always helpful. Small amounts of tap water and whiskey by the rectum, such as a half ounce of whiskey and six ounces of tap water every two hours, are much better than amounts at greater intervals, and more apt to be retained. If the rectum does not retain the fluid, it is given by hypodermatoclysis, a measure I find very useful. Fluids must be administered in some way. After twenty-four hours, if there is no vomiting, small amounts of fluid are given by mouth and gradually increased.

The frequent use of the stomach pump has been a very helpful factor in these cases. We should never be afraid to use it. I have never seen harm from its use and I am sure many cases have been relieved from the annoying and distressing vomiting which frequently follows operation.

The time drainage should be continued will have to be governed by the quality and quantity of discharge, but it must be remembered that in this condition we can allow a drain to remain in place too long. It has been my habit to dress the wound daily, and to remove the drain as soon as possible.

In all cases, except Case No. 38, the drainage was entirely removed within one week. The exception was a man 35 years of age, who had been suffering from gastric disturbances for twelve years, and whose perforation had occurred eighteen hours before admission to the hospital. He had tuberculosis of both lungs. At operation we found his abdomen almost filled with a greenish, foul-smelling fluid, containing food particles which had a typical colon bacilli odor. I never saw so much fluid in an abdomen before. The culture from the fluid showed the presence of staphylococci, streptococci, and colon bacilli. His perforation was large enough to admit my thumb, and it was with a great deal of difficulty that suturing was accomplished. For forty-eight hours the patient seemed all right; then he developed a gastric fistula, the discharge from which seemed to digest his abdominal wall, but this fistula closed after a stormy convalescence. I saw this patient a week ago and found him in fine physical condition, having gained fourteen pounds in weight.

SUMMARY OF CASES.

In 30 per cent. of the cases there was no history of gastric disturbance prior to the perforation.

In 1 per cent. of the cases vomiting was not present.

In every case nausea, pain, and board-like rigidity of the abdomen were present.

In 72 per cent. of the cases the ulcer was closed by suture.

In these cases 70 per cent. were cured—30 per cent. mortality.

In 28 per cent. of the cases gastro-enterostomy was performed. Of these 33 1/3 per cent. were cured and 66 2/3 per cent. died.

The mortality in cases operated upon more than eight hours after rupture was 66 2/3 per cent.

The mortality in cases operated upon before six hours was 20 per cent.

I am deeply grateful to the members of the surgical staff of Harlem Hospital for allowing me to report these cases, particularly to Dr. Haubold, on whose service most of these cases occurred and through whose courtesy I was allowed to operate.

A CLINICAL LECTURE ON VOLVULUS.

(Delivered at St. Bartholomew's Hospital Wednesday, April 26, 1916.)

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Introduction. Volvulus is a twisting of the intestine upon its long axis until there is sufficient interference with the blood supply to cause strangulation unless relief is afforded. The exact mechanism of its production is unknown, but the two necessary factors are, first, a congenital or acquired defect in the intestinal attachment allowing of a free mobility and, second, a condition producing an artificial pedicle.

CASE I. The patient was an unmarried woman, aged 57, a teacher by profession, who was admitted into St. Bartholomew's Hospital on March 2, 1916, complaining of abdominal pain. She said that after getting into bed at 9.30 on the evening of March 1st she had been seized with a sudden attack of pain which extended across the hypogastric region. The pain was accompanied by retching and she soon began to vomit a brown fluid, the vomiting continuing until seven o'clock the next morning. Her bowels had been relieved naturally in the afternoon of March 1st: during the night she had passed much flatus after four enemata of soap and water.

At 9.30 A. M. on March 2d she was sent to London by motor car, a journey of 25 miles. When I saw her at 2 P. M. she looked ill, was complaining of stomach-ache; had a temperature of 99.8° F.

and a pulse of 110. The abdomen was greatly distended, but not uniformly, for the distention was on the right side below the level of the umbilicus than at other parts. The abdominal walls were not very tense and the swelling on the right side had a well-defined smooth upper border which suggested the presence of an ovarian cyst. Percussion, however, showed that the swelling was resonant. Half an hour later the patient was operated upon under a general anesthetic. An incision was made to the right of the middle line through the fibers of the rectus abdominis and a considerable quantity of blood-stained fluid escaped as soon as the peritoneum was incised. The tumor was found to be a greatly distended loop of large intestine. It was turned out of the abdominal cavity and was then seen to be the cecum anchored at its free end by the adhesion of an inflamed vermiform appendix to the pelvic structures and rotated upon itself at the ascending colon. The appendix was freed, the meso-appendix tied and the appendix removed. A grooved director was passed into the cecum through the opening left by the removal of the appendix and the cecum was emptied of its fluid contents and flatus. It was then easy to untwist the colon by rotating the cecum through two complete turns from left to right. The director was removed and the stump of the appendix closed after being disinfected in the usual manner. It was noticed that the cecum had been so greatly distended that its serous coat had cracked in several places and that it lay as a flaccid and inert mass after it had been emptied. One cc. of pituitrin (solution of the infundibular extract) was given hypodermatically before the patient left the operating table in the hope of increasing the peristalsis of the intestine and the injection was repeated three times at intervals of an hour. The patient passed a fairly good night, although the abdomen was still much distended, and on the day after the operation hypodermatic injection of one one-hundredth of a grain of eserine combined with eight minims of liq. strychnine hydrochlor. were administered. The abdominal distension remained but without rigidity for ten days, by which time it had disappeared, and the bowels, which had acted only after an enema, operated naturally. The patient made a good recovery and was discharged from the hospital on March 27th. I am indebted for these notes to my dresser, Mr. H. B. Jackson.

CASE II. Henry D., aged 3 days; was admitted into St. Bartholomew's Hospital under my care March 2d, 1916, suffering from intestinal obstruction. On admission the infant was vomiting meconium; its abdomen was greatly distended and it seemed to be in pain. Examination showed that the anus was well-formed, but on passing a director into the rectum it was thought to be arrested an inch and a quarter from the anus. A diagnosis was made of imperforate rectum. Under a general anesthetic the rectum was explored through a median perineal incision. No feces escaped and the child was turned on its back and the abdominal cavity was opened by an incision in the left iliac region. The descending colon was found to be empty and contracted but the small intestine was greatly dilated. The small intestine above the dilated portion was secured to the edges of the wound and was opened. The combined operation took only a few minutes and the infant subsequently showed no signs of shock. The enterostomy acted satisfactorily, but there was much vomiting, food was taken badly and death occurred on March 10th, eight days after admission and eleven days after birth. The post-mortem examination of the abdominal viscera showed that the stomach was dilated, the pylorus was normal and the upper two feet of the small intestine were natural. An enterostomy had been performed 2½ feet from the duodeno-jejunal flexure, the bowel being here considerably dilated. A short distance below the enterostomy the bowel suddenly became contracted without any evident local cause of obstruction, but all the small intestine below this—about three feet—was twisted several times in a clock-wise direction around the mesentery and was very contracted. The large intestine was also contracted, but was otherwise normal. The rectum and anal canal—apart from their having been incised by a perineal wound—were normal.

I am indebted for these notes to Mr. Cameron, the dresser of the case.

CASE III. I find two other cases of volvulus occurring in newly-born children. The first is recorded by Mr. W. Harrison Cripps*. A child was admitted into St. Bartholomew's Hospital under the care of Mr. Alfred Willett on the third day after birth suffering from obstinate vomiting and having had no passage of fecal matter by the anus. The abdomen was moderately distended. The little finger could be introduced only a short distance within the anus, which appeared to end in a cul-de-sac. As the infant was thought to be suffering from an imperforate rectum Littré's operation of colostomy in the left groin was performed, the portion of intestine that presented itself being opened and stitched to the wound. Death occurred from peritonitis on the third day.

The autopsy showed that the rectum, the whole length of the colon and a couple of feet of the ileum were perfectly normal, though firmly contracted into a muscular cord no thicker than a pipe-stem. Above the spot mentioned the small intestines were greatly distended. The distended portion of the bowel ended abruptly by a loop making a complete twist upon itself, the loop being folded over in such a way as to cause complete obstruction to the lumen. The displacement was remedied at once by untwisting the loop. Pressure on the upper part of the distended intestine immediately caused the contents to pass into the previously empty portion of the bowel. The undilated portion of the bowel below the seat of obstruction was much smaller than it should have been at the full period of fetal life, a condition probably accounted for by the absence of all meconium from its interior, which should have stimulated its growth.

(* Trans. Pathological Society of London. Vol. 31, 1880, p. 111 and The Lancet, 1880, vol. 1, p. 768.)

CASE IV. In 1891 Dr. Newton Pitt* showed a case of volvulus in a new-born infant, saying that a new-born child was admitted into Guy's Hospital under the care of Mr. Clement Lucas. The infant was unable to have any movements and had a distended abdomen. As the rectum was thought to be imperforate, an incision was made in the left iliac region and a distended coil of intestine was sutured to the abdominal wall and opened. The child died two days after its birth.

At the post-mortem examination the abdomen was found filled with distended coils of intensely engorged ileum. The colon and rectum were normal, empty and patent. The ileum for two feet above the cecum was healthy and empty. Above this, but with no very sharp line of demarcation from the healthy bowel—such as existed from the upper limit—there commenced a condition of intense engorgement and inflammation. For the next three feet the bowel was almost black from strangulation and engorgement with blood, which had led to thickening of the wall; this area was also the most distended portion of the bowel. At the upper limit there was a sharp line above which the bowel was free from any engorgement or distension, and there was no sign of any linear ulceration or marking such as would probably have been present if the bowel had been constricted by a band. The mesentery presented no abnormality as to length.

A careful search failed to reveal any band or adhesion. There was some lymph on the peritoneal surface of the strangulated bowel; elsewhere the peritoneum was normal.

There were no evidences of any intussusception. The portion of bowel which had been attached to the left inguinal region was part of the strangled bowel; the spot opened was three feet from the cecum and was less engorged than some of the bowel above it. The remaining viscera were normal. The colon was empty and contracted; while a volvulus of the ileum had formed.

CASE V. The following case is quoted by Keating† in his Cyclopedia of the Diseases of Children as volvulus in a child: A child aged three years had suffered from intestinal obstruction for four or five days before medical assistance was sought. All the food taken had been vomited and the vomit had become stercoraceous. When the child was seen the face was anxious and rather pinched. The abdomen was distended and slightly tympanitic; there was no jaundice or hepatic enlargement, no evidence of tumor nor any sign, upon examination of the rectum, of intussusception of the bowel. There was much rumbling and gurgling to be felt and heard. The temperature was 100° F. An effort was made to inject some water into the rectum, but after an ounce or two had been injected no fair force would procure the admission of more. The parents stated that some years before the child next in years to the present patient had died with somewhat similar symptoms. A post-mortem examination had been made and the cause of death discovered, but as the doctor had moved, it was impossible to obtain further information. An operation undertaken on the evening of the day the child was first seen showed the abdominal viscera were normal except at the sigmoid flexure. The bowel in this part of its course was found to be lying out of its plane, thickened and deepened in color, with a long mesentery upon which, and with which, it was doubled. The distended bowel emptied itself with a gurgle as soon as it was lifted up and the abdomen was closed. Little or no effusion was found in the peritoneal cavity. The child died eight hours later.

Remarks. You will learn two facts from these cases. The first is already known, that volvulus is one of the causes of acute intestinal obstruction, in which operation is likely to be postponed because its course is not violent, although its onset is sudden; the second fact, of which you were probably as ignorant as I was myself, is that volvulus may occur in new-born children. I hope, however, that you will think of volvulus in children solely as a pathological curiosity. Volvulus is one of the commoner causes of acute intestinal obstruction in adults; it is rare in old people; it is rarer still in children; it is rarest of all in infants.

Pathology. Volvulus requires for its production a loop of bowel lying less securely packed than usual in the abdominal cavity; a loaded bowel and irregular peristalsis. The result is a twist of at least one turn, more frequently of a turn and a half or two turns of the loop upon itself much in the same way that acute torsion of the testis takes place spontaneously, often in the mesorchium, less commonly in the spermatic cord. In volvulus it is usual, but by no means necessary, that the mesentery should be unduly long. Dependence and loading of the loop of bowel are important factors in the production of volvulus which occurs therefore in adults at the cecum or sigmoid and in the new-born at the jejunum or ileum. If the twist in the long axis of the loop is less than a turn and a half, I believe that the bowel has the power of untwisting itself, for in two or three cases the patient has complained of similar symptoms, but of less intensity, before the attack which needed an operation for its relief.

Symptoms. The onset of volvulus is sudden and painful and occurs in persons who have had reason to believe that they were in their ordinary health. It may occur without any known cause, as in case I, where the patient had gone to bed, or it may follow some injury to the abdomen. As a result of the shock given to the intestinal musculature there may be an involuntary emptying of the bowel below the seat of the volvulus. The pain is persistent or is

(* Trans. Pathological Society of London. Volume 42, 1891, p. 123.)

(† The reference is incorrectly given. It should be The British Medical Journal, 1887. Vol. ii, p. 829.)

characterized by exacerbations. It is of the nature of a stomach-ache and is not often so severe as to lead the patient to call immediately for medical assistance. It usually happens, therefore, that the patient has been ill for at least some hours before he is visited. The position of the volvulus determines the time of the appearance of the signs of intestinal obstruction. If the sigmoid is involved the signs appear early; when the cecum is twisted they may be delayed until the large intestine has emptied itself or they may be masked by the discharge of flatus generated in the great bowel. The onset of vomiting may be delayed or in some cases may even be entirely absent, but it is usually a marked feature of the condition. When the initial shock has passed off and in spite of the pain the patient does not suffer from any great degree of shock and neither the pulse nor the temperature is much altered.

Signs. Examination of the abdomen within a few hours of the onset of symptoms will give a clue to the cause of the obstruction because volvulus is always attended with abdominal distension and at first this distension is limited to the portion of bowel involved. In the early stages there is no inflammation of the parietal peritoneum and the abdominal walls are not rigid. The abdominal distension appears therefore to be, as it really is, limited to the affected region and the distended portion of gut can be felt through the abdominal walls. Later in the course of the disease when the whole bowel has become paralyzed this important diagnostic sign is lost, for the abdomen becomes uniformly distended. Local tenderness over the actual seat of the volvulus is present, but is not usually very marked until the onset of peritonitis.

Diagnosis. You will have no difficulty in recognizing the case as one of so-called "acute abdomen" if you do not mistake it for cramp or colic and you will probably be able to go farther than this at once and look upon the condition as one with which you are not familiar. The patient is suffering from intestinal obstruction which has lasted for some hours at least before you were consulted. Examine first for a strangulated hernia, since this is the most common cause of acute obstruction and can be excluded at once.

The facial aspect tells you that the condition is not one of acute perforation of the stomach or duodenum and this is confirmed by the comparative mobility of the abdominal walls and the absence of the rigidity which is characteristic of perforation.

Biliary colic and renal colic pass through your mind only to be excluded after a short physical examination.

The rarer conditions leading to acute obstruction may then be considered. Strangulation by a band usually has a slower onset, and the symptoms are less acute in the earlier stages and meteorism is not so well marked.

In acute hemorrhagic pancreatitis the patient is more apathetic; he is very fat; there is a history of potus; the pain is felt in the epigastric and lumbar regions. The urine should be examined to determine whether it shows an increased diastatic activity.

Thrombosis and embolism of the mesenteric vessels most closely resemble volvulus and except by abdominal exploration I do not know how a diagnosis can be made. The patient is seized with sudden abdominal pain; there is perhaps rather more collapse and there is an absence of the localized abdominal swelling which is so common a feature of volvulus in its earlier stage.

Appendicitis, even in its most acute onset, should not enter your thoughts when you are examining a case of volvulus. The signs and symptoms are widely different.

Prognosis. The prognosis at the present time is extremely unfavorable, but I hope that you will live to improve it, just as we, in our generation, have improved the prognosis of intussusception. The improvement rests entirely with yourselves, for it depends upon early recognition and upon early recognition depends the success of operative treatment. If you are contented with a diagnosis of stomach-ache, colic or cramp, give a purgative, or worse still, opium, and then wait awhile before you send for the surgeon, your patient will almost certainly die and his blood is on your head. If you recognize the case as one of acute intestinal obstruction and insist upon immediate operation, some of your cases will recover. Insistence upon your part will be necessary to overcome the natural repugnance of the friends to sanction an operation for a condition that does not appear to them to be very urgent and from which they will very properly urge the patient has recovered on previous occasions.

Statistics. You must, however, point out that the mortality is appalling. I have been over the records of our hospital from 1899 to 1915. During that time 25 cases of volvulus were admitted—14 men and 11 women. Twenty-one of these patients died, and one recovered. The statistics from St. Thomas' Hospital* are more favorable, but it should be re-

(* Corner and Sargent, Volvulus of the Cecum, Annals of Surgery. Vol. 41, 1905, p. 62.)

membered that they deal only with volvulus of the cecum, whilst in our cases there are several instances of volvulus of the small intestine—a still more deadly condition. Corner and Sargent state that "of 57 cases of volvulus of the cecum 19 were operated upon and recovered, whilst the other 38 died, of whom 21 were operated upon. The total mortality, therefore, would appear to be 66 per cent., whilst the mortality after operation works out at 52.5 per cent."

CASE VI. This is a good example of what happens if you treat your volvulus cases upon Mr. Asquith's principle of "wait and see." It is even less satisfactory in surgery than in politics:

A woman, aged 49, was admitted with a history of absolute constipation for the previous ten days. On admission the patient appeared not so ill as the circumstances of the case would suggest; the pulse, however, was quick and running. The abdomen was distended, tympanitic and appeared to contain much free fluid. She complained of severe abdominal pain, which did not seem to be localized to any definite part of the abdomen. Vomiting was frequent and the ejecta were of a stercoraceous character. There was absolute constipation and an enema was given without good result. Soon after admission the patient was submitted to operation. The peritoneal cavity was opened by a median incision when several pints of blood-stained serous fluid escaped. The patient then suddenly became much worse, the face becoming livid and the pulse more feeble. A hurried digital examination of the alimentary canal was made, but it was not possible to locate the obstruction. A projecting coil of intestine was then stitched to the abdominal wound, incised, and a glass drainage tube fixed to it. Several pints of brown fecal-smelling fluid escaped. A few hours afterwards the patient died, never having recovered from the condition of collapse which came on during the operation. At the post-mortem examination the abdomen was found to be the seat of general peritonitis and the small intestine was distended for its entire length to more than twice its ordinary size. The cecum was dilated to six times its normal size and extended upwards into the epigastrium and the left hypochondrium. It was twisted upon itself to form a volvulus. The twisted portion of the intestine extended from the ileo-cecal valve to the middle of the ascending colon. The portion of intestine opened was a few inches below the termination of the duodenum.

Treatment. Early diagnosis, therefore, as in all cases of intestinal obstruction, is the key to successful treatment and early diagnosis is even more desirable in cases of volvulus than in other forms of obstruction. The mere twisting of a loop of bowel upon itself does not appear to be associated at first with very acute inflammatory changes and there is no great amount of plastic effusion for some time after it has occurred. Early operation allows the bowel to be emptied and untwisted with comparative ease. The loop involved is paralyzed owing to absorption of toxins from its imprisoned contents, but gangrene and peritonitis are of late onset. An operation should be performed in every case as soon as the patient is seen. It should be carried out as rapidly as is consistent with safety. It is of the utmost importance that a sufficiently large incision should be made in the abdominal walls to give free access to the viscera. It is clear on reading the records of the cases of volvulus that some of the patients died unrelieved even after operation because the twisted portion of the intestine was not discovered until the post-mortem examination. When the abdominal cavity has been opened an examination should be made first of the cecum, then of the sigmoid, but it should be borne in mind that the small intestine is occasionally twisted. The distended loop of bowel should be packed off to prevent other parts being soiled and it should be opened at once because it is easier to make a systematic examination with the loop flaccid than with it distended. Close the opening with Lembert's sutures after the edges of the incision have been disinfected and then proceed to examine the twist. It may prove to be so simple that a couple of turns in the reverse direction will unravel it. It may prove so complicated as to need all the operator's skill and ingenuity and he may still be foiled. In such cases it may be necessary to make a temporary artificial anus. If it is necessary to do so, be careful that you are really above the seat of the stricture.

CASE VII. There is an interesting specimen in St. Bartholomew's Hospital Museum (No. 2177b) in which the artificial anus was made in the posterior aspect of a twisted cecum, where it was not only useless but effectually prevented any reduction of the volvulus.

The history attached to the specimen makes it clear that the case was diagnosed incorrectly. The museum catalogue states that it is "The cecum, the lowest part of the ileum and the colon. This portion of the intestine is involved in a volvulus which has resulted in the intestine being twisted three times on its transverse axis from right to left. The cecum is attached by sutures to the abdominal wall, a portion of which is left in the preparation; it is gangrenous in patches, and in one place has completely ulcerated so as to lead to a perforation of the intestine. No feces have escaped, however, owing to the surrounding adhesions. On tracing the gut backwards it is seen that the colon beyond the splenic flexure, instead of passing across the abdomen to form the transverse arch, descends vertically to the left iliac fossa. It returns from this point to the lower border of the stomach, forming a U-shaped bend. It then turns to the right and, having reached the median line of the abdomen, again runs downwards to end in the cecum, which

was situated over the last lumbar vertebra almost in the middle line.

The specimen was obtained from a man aged 63, who was seized suddenly with severe abdominal pain and vomiting. His bowels, which had been regular up to the time of the seizure, became obstinately constipated. On his admission to the hospital two days later nothing could be found to account for the pain, but there was a slight fullness and tenderness in the right iliac region. Stercoraceous vomiting set in eight days after the onset of symptoms and the abdomen was then opened in the middle line and a portion of inflamed and distended cecum was secured by sutures to the abdominal wall. The patient died on the following day."

After-treatment. Your responsibilities begin when the operation is completed and the surgeon has gone home, for you are entrusted with the after-treatment. You have to remember that a segment of paralyzed gut lies in the peritoneal cavity, that an incision has been made into it and that the incision has been sutured. It must not be overstimulated for a few hours nor overloaded. Repair takes place readily and is sufficiently complete for all practical purposes within seventeen hours of the operation. Recovery from the paresis is more gradual, but under favorable circumstances it is complete. The patient should not be given anything by the mouth for the first twelve hours after the operation, though the mouth may be rinsed out with warm water from time to time if thirst is distressing. Three or four doses of pituitary extract in the form of hypophysine may be given hourly by the injection into the muscle of ½-1 cc. in the hope of causing contraction of the involuntary muscle of the body, thereby stimulating the unstriated muscle of the intestine. Turpentine enemata, too, are serviceable as stimulants to the partially paralyzed large intestine.

Instead of making general statements, however, it will be profitable to ascertain what was actually done in the matter of after-treatment in the case of volvulus which recovered. Here is the record of the after-treatment of the first case:

The operation was completed at 3.30 P. M. Immediately upon the return of the patient to the ward a saline rectal injection was administered consisting of twenty ounces of a three-quarter per cent. solution of common salt at a temperature of 98°-100° F. The enema was given slowly and as the patient was not very collapsed it was found possible to introduce only about fourteen ounces. One-drachm doses of water were given every half hour from the time the patient recovered consciousness after the anesthetic until twelve o'clock midnight. After this hour the sips of water were replaced by two-drachm doses of albumin water, made by mixing the white of one egg with eight ounces of sterile water in which five grains of salt were dissolved. The albumin water was ordered to be given every half-hour (if the patient was awake) alternately with an equal quantity of whey. The albumin water and whey were given alternately every half-hour until eleven A. M. on the day after the operation. From eleven A. M. on the morning after the operation and for the next twenty-four hours an ounce of peptonized milk, whey or albumin water was given every hour during the day and every two hours during the night, unless the patient was sleeping. The amount was increased to two ounces hourly from midday on the second day after the operation. On the third day malted milk, beef essence, chicken broth, calf's foot jelly and weak tea were ordered to be given in doses of three or four ounces at a time every two hours by day and every three hours at night, if the patient did not vomit or complain of pain. The same diet was continued on the fourth, fifth and sixth days, the amount being increased to four or five ounces each time.

On the fifth day she was allowed a thin slice of bread and butter without any crust. No change was made on the sixth day. The patient was allowed a little pounded fish and a custard pudding on the seventh day. On the eighth day she was permitted to choose either pounded fish or pounded chicken and was given in addition a lightly boiled egg and a larger quantity of bread and butter. On the ninth day she had boiled fish and mashed potatoes for her dinner and on the tenth day boiled chicken and mashed potatoes with a milk pudding afterwards. From the tenth day onwards she was put upon the hospital "convalescent diet," which consists of tea, half a pint, and butter, half an ounce, twice a day; mutton chop (dressed without bone), four ounces, or one of the following: minced or pounded meat, four ounces (dressed without bone); fish, four ounces; rabbit, four ounces; mashed potatoes, six ounces; pudding (not suet), eight ounces; milk, two pints; bread, twelve ounces.

The local treatment consisted in passing a rectal tube every four hours (as the tympanites was great) up to the fifth day, by which time the abdomen had regained its natural size. One cc. of pituitrin was given hypodermatically as soon as the patient returned from the operating theater and this was repeated in the course of the evening. Two hours after the operation a turpentine enema was given consisting of one pint of soap and water, one ounce of turpentine and one ounce of olive oil. Two hours later an enema of asafetida was given at a temperature of 100°-105° F. An ordinary soap and water enema was given daily until the tenth day. On the day after the operation, as the tympanites had not decreased, one-one hundredth of a grain of sulphate of physostigmin (eserin) was given hypodermatically and was repeated for the following six hours.

An ounce of castor oil was given by the mouth on the tenth day and this was followed on the eleventh morning by a dose of magnesium sulphate. The dose of sulphate of magnesium was repeated night and morning as often as it was required during the remainder of the patient's stay in the hospital.

You will see from this record that the after-treat-

ment was directed to a reduction in the tympanites, for we recognized that the tympanites was a measure of the intestinal paresis and that as the distension diminished the patient would improve.

CHOICE OF METHOD IN THE TREATMENT OF FRACTURES.*

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If one consult the literature concerning fractures, in the text-books, periodicals or monographs, one is immediately struck by the fact that the result of treatment in fractures, by any other method except that advocated by the individual author, is very bad. Still more remarkable is the fact to be gathered by a study of the supposed authorities upon the subject that the methods of treatment which in one man's hands have led to most excellent results are condemned by another as worthless or dangerous. this is certainly confusing; but what perplexes the student still more is the fact that when he encounters the results obtained by the average medical practitioner in his treatment of fractures, he finds, no matter what the method used, an appalling percentage of poor results.

There must be some definite reason for the difference of opinion as to the proper method of treating such common injuries as fractures; and there certainly must be some cause for the discrepancy in the published reports and the actual results encountered in practice.

It is my purpose here to tell what in my opinion is responsible for this anomalous condition of affairs. With the elucidation of the cause, the remedy is not far to seek.

When bones are fractured there is not only injury to them, but also more or less injury to the surrounding soft parts. As a consequence, there is present, besides the actual tearing of the tissues, hemorrhage and muscular irritation. Immediately following the injury the muscles are completely relaxed and there is no difficulty in placing the fragments in alignment. But soon after the direct shock of the injury has subsided, reflex and direct muscular irritation begins and leads to spasmodic contraction. As the fragments are free, or later when the callus is still soft and deformable, the force of muscular contraction, instead of acting upon the joints, is exerted upon the yielding callus. Thus the site of the fracture is converted into a partly or completely uncontrolled joint and the fragments are dislocated upon each other.

It is our aim in treating fractures to replace and to retain the fragments in their normal anatomical relation until consolidation is complete. In order to do this we must, first of all, know the obstacles to be overcome. Though the action of gravity is fully appreciated, the fact that muscular contraction is the largest factor in resisting not only the reposition of the fragments, but also their retention, is rarely sufficiently emphasized by writers and teachers upon the subject. It is because it is too frequently forgotten that the muscular contraction will continue to act upon the fragments and cause dislocation even when the action of gravity has been overcome, that the surgical dressing applied is ineffectual.

Unless the splints, no matter what their nature, or how applied, resist the muscular spasm, deformity is sure to occur.

Thus in fracture of the femur, for example, dislocation of the fragments is almost sure to take place in a plaster of paris bandage which does not include the hip, the knee, and the foot. Unless the bandage is applied while the muscles are completely extended and this extension is maintained when the plaster has set, subsequent muscular spasm will lead to overriding.

Such a bandage perfectly applied will in the majority of cases lead to a good result. But the practitioner who endeavors to apply it must have had the proper training, and he must have the proper apparatus necessary for its application at hand, if this procedure is to be successful. As few surgeons, and fewer general practitioners have either, it is not surprising that this method of treatment has been to a considerable extent discredited. The ill results complained of by surgical writers are not due to any inherent faults in the method, but to the lack of skill in its application. In the hands of the expert the plaster of paris bandage is an excellent method of retaining the fragments in their proper relation in this as well as other fractures, for when the bandage is properly applied the fragments are held in apposition, the muscles are retained at rest, and the patient is able to be moved or be about without pain.

As so few surgeons have had the proper training to care for fractures with the plaster of paris bandage, or the necessary mechanical skill to apply splints, it is easy to understand why the operative treatment for fractures which, with hospital facilities, is comparatively easy to carry out, has been so strenuously advocated. There can of course be no doubt that there are some unusual forms of fracture which can be held in place by no other appliance except a splint applied directly to the frag-

*Read before the Orthopedic Section of the New York Academy of Medicine, March 18, 1916.

ments. Nor can it be denied that one can procure good results by operative measures in fractures generally. But unless the surgeon who undertakes to apply this form of treatment understands the mechanical needs, and has the facilities for perfect aseptic operating, this operative method will be a failure and the patient subjected to the risk of a fatality.

I am well aware that in the hands of the competent surgeon, who has mechanical skill and adequate hospital facilities, this risk is small; but it exists nevertheless. In the hands of those who are not competent, the life risk is not inconsiderable, and the actual results are surely no better and often much worse with this method of treatment than under any other similar circumstances.

Whatever may be the statistics or the dogmatic statement of the operating surgeon to be found in the literature regarding the results of operative treatment, my own experience, which is confirmed after operation by that of other orthopedic surgeons, has led me to believe that non-union is more frequent than, and mal-union equally as frequent as with other forms of treatment. In children with fracture of the femur, for example, I have seen both mal-union and non-union; and I can now recall two cases with non-union in which firm union in good position was obtained by a plaster of paris dressing. In these it required only the removal of the plate to make the cure complete.

I do not wish to convey the impression that operative treatment is not a justifiable or a successful method in the hands of the skilful practitioner. What I wish to emphasize is that, for the unskilful, or those not especially trained, it is just as likely, or more likely, to lead to ill results as any other method and in addition it is an operation with a distinct life risk.

It is true that the operative methods are attended by brilliant results in the hands of the skilful surgeon, with a knowledge of mechanics. Indeed, there are cases in which a really perfect anatomical result can be obtained in no other way. On the other hand, the vast majority of physicians, and these see by far the greatest part of the fracture material, have neither the training, the talent, nor the facilities of carrying out the operative methods. And their results are, as I know from experience, if anything, worse than those obtained by the older method of plaster and splint.

Thus the reason why the various writers upon this subject are able to gather statistics showing ill results from treatment by any method but the one they have supposedly discovered, or advocate, becomes evident. Not the methods, though some of them are faulty, but the inability to carry them out, are to be blamed for the disability which so often follows fractures.

Primarily, the fault lies with the training the medical student receives at college. At the present time the majority of surgical teachers are apparently content when they can impress the student with their own operative skill or ingenuity in applying complicated bandages. The student learns very little from this. The majority must practice medicine in localities far from hospital facilities; they have neither the training nor the apparatus to apply plaster of paris properly; and they have not been taught anything of the physio-pathology of fractures, or how with the means at hand they can apply the mechanical principles which should govern the treatment of fractures when they know them. Under these circumstances it is not at all surprising to find the results of the treatment of fractures unsatisfactory.

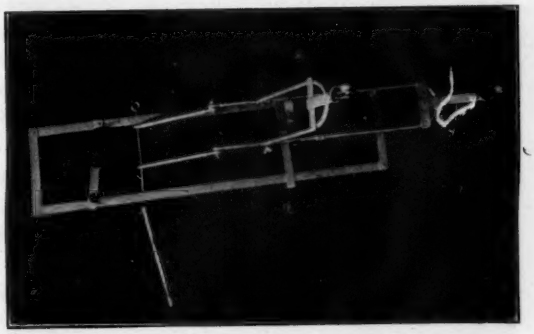

Fig. 1. Extension apparatus made of gas pipe which can be adjusted for any length and to fit in any bed. The frame and the extension apparatus proper can be extended by interpolation of extra shoulders (c) to any length. The frame is covered with canvas which has an appropriate opening for the use of the bedpan, and as the apparatus as a whole is lifted, the pan can be placed under him without disturbing the position of the parts. At (b) is a cross-piece with buckles which can be fastened to the frame at any desirable point; to this are attached peroneal straps for counter extension. A rest (d) which can be moved to any part of the frame and can be raised or lowered serves to maintain the extension frame proper at any angle. The additional frame (e) fits on the leg portion of the frame and can be moved up or down so that the cord running over the pulley will pull only in a direct line. Any intelligent gasfitter can make such an apparatus.

Would it not be better to spend the time now devoted to the exploitation of individual and special methods to teaching the student the pathology of the conditions under discussion, and the means, which any man of average intelligence can carry out, for treating these conditions? Certainly the student with a practical knowledge of at least the mechanical principles involved is better able to use his knowledge, and he certainly is much less likely to be a menace to the community in which he practices, than one who comes from college with only a half-baked knowledge of the operative surgery of

fractures, which he has neither the training nor the facilities to apply.

Such a course in the care of fractures cannot be said to present unusual difficulties. On the contrary, the subject can be made so simple and so practical that every student when he leaves college can care for the common fractures both to his own and to the patient's advantage. It is of course impossible to demonstrate a complete course of instruction in a short paper of this kind. But its feasability is readily demonstrated by a few concrete examples.

In fractures of the shaft of the femur, for instance, the irritation and contraction of the muscle as the cause of deformity is readily demonstrated. It can be shown both in a model and on the patient, that the muscular shortening which follows the fracture diminishes the distance between the origin and the insertion point and thus prevents the alignment of the fragments when the limb is straight. Not only the muscles attached to the broken bones are irritated and contracted, but all the muscles in the neighborhood of the fracture are involved; thus not only the vasti, but the rectus and the hamstrings are also shortened. As has been said, these muscles can be made to undergo relaxation under anesthesia, and the fragments retained in position by direct splinting; or the muscles may be stretched by means of an especially devised extension apparatus or a fracture table, and the extension and the apposition of the fragments maintained by a plaster bandage.

There is still another method of retaining the muscles on the stretch, viz., continuous extension; all that is necessary in this case is to emphasize that the continuous extension must be exerted in the direction in which the muscles of the limb pull in a straight line. As this is equivalent to the position of greatest muscular relaxation, the position in which the limb must be held in order to secure reduction, the method of reduction, and continuous extension in the proper direction may be taught simultaneously. It is not necessary to burden the student with all the mathematical considerations involved; the facts may be demonstrated upon a very simple model. In the majority of cases the position of greatest relaxation is the position of semiflexion, or the middle position. Continuous extension, when it is necessary, may be applied to the limb in the position of relaxation by means of any simple apparatus.

Fig. 1 illustrates an example of such a mechanism, which is simply a modification of the extension apparatus used for many years at the Hospital for Ruptured and Crippled, New York, for extension in the line of deformity. The apparatus is constructed of gas pipe, its cost is not above a few dollars, and it can be made by any machinist in a few hours. It permits, as can be seen, of any degree of flexion and, depending upon the site of fracture, the pull may be exerted upon the femoral or leg muscles.

With such a frame it is possible to gradually extend the contracted muscle so that the bones are in absolute alignment, with the limb firmly held in the desired position. I have found that with the use of this or any apparatus which does the same thing, the average medical practitioner can obtain results which compare favorably with those of the most expert operator or the most skilful bandagist, with all the facilities of a modern hospital at his disposal.

Fig. 2. (A). Abduction splint made of wood and covered with Mexican felt, of such simple construction that anyone can make it. (B). An abduction brace for the shoulder which can be adjusted for either arm and has a hing joint at the elbow.

In the majority of fractures which the average practitioner sees early, that is before muscle contraction is prominent, continuous extension is rarely an absolute necessity. If the medical man has been taught the middle position of the joints of the affected limb, he can readily acquire the little extra knowledge required to apply the simple dressing necessary to retain this position. So for instance in fracture near the shoulder joint, we know that we must overcome the powerful adductors in order to reduce the fracture. Formerly it was the practice, and this practice is still continued extensively, to set the arm and then bring it down to the side, where it is held until union has taken place. A large number of the patients so treated are compelled to undergo a long period of painful after-treatment to regain the power to abduct the arm. Of these, not a small percentage never regain this power. For this reason it has been assumed by a number of authorities that conservative treatment of shoulder fracture is a failure and that operative treatment is the only procedure in such cases.

I know, however, from what I have seen of the

results of operative procedures in these cases that the result following operative methods may be and often are no better than the conservative treatment carried out in the orthodox way.

On the other hand, when physiological and pathological phenomena associated with such injuries are taken into consideration and the treatment is based upon them, the results are as nearly perfect as surgical methods can be. Moreover, the method of procedure is so simple that anyone with ordinary intelligence can carry it out without difficulty.

It is unnecessary at the present time to go into the anatomical details. The abductors and external rotators of the shoulders will, when there is a fracture at or near the surgical neck, abduct the upper fragment and rotate it outward, while the adductors, internal rotators, and the force of gravity will bring the lower fragment close to the side. Hence, the fragments may be impacted by simple abducting and rotating the arm outward. In many cases the fragments will show no great tendency to become redislocated even when the arm is again brought down to the side. In some, however, spasm of the adductors leads to subsequent displacement.

But even in the cases in which the displacement does not occur, the adductors become shortened, as do all muscles which are left for a comparatively short time, with their origin and insertion points approximated, and in practically all cases require at least some, and in not a few a protracted period of after-treatment in order to restore the normal length of the muscles and the power of abducing the arm.

Now if, on the other hand, the shoulder is retained in the position which secures approximation of the fragments, coaptation is not only retained, but shortening of the adductors, etc., is prevented and, after union has taken place, the weight of the arm will overcome whatever shortening of the abductors has ensued, and thus the after-treatment, which has been almost entirely conducted by gravity, will be short and practically painless.

For this purpose I use either a plaster of paris bandage, which is not very comfortable, or the very simple abduction device here illustrated (Fig. 2B). This apparatus has a joint at the elbow permitting a certain amount of motion of the forearm, and can be lengthened to fit any patient and reversed to fit either arm. I have found this brace most convenient, easily applied, and worn with comfort. However, while such an instrument is advantageous, it is not absolutely necessary, for an abduction splint which carries out the same mechanical requirements can be made to fit any patient by a carpenter or by the practitioner himself, if he is at all skilful with tools (Fig. 2A).

Almost analagous conditions exist in the fractures at the neck of the femur, and there, too, any apparatus which will retain the limb in abduction will not only keep the fragments in alignment, but will prevent adductor contraction and subsequent limitation of joint motion.

The simple modification of the Thomas hip splint, here illustrated (Fig. 3), which can be fixed in any degree of abduction, may be used to retain the limb in this position. Such a splint can be made to fit

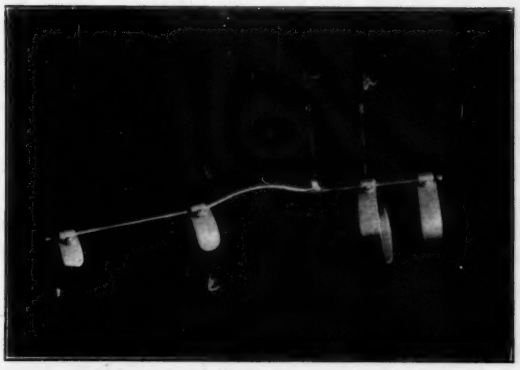

Fig. 3. Modifications of the Thomas hip splint. It consists of two shaped bands of steel connected by a bolt at (b). The two bands may be fixed by means of this bolt at any angle to each other and thus any degree of abduction may be obtained. The half rings (a) are of various sizes, and slide over the steel bands; any number of them may be placed upon the bands, serving as pelvic, thoracic, thigh, and leg bands (c), and they may be so arranged and kept in place by screws as to secure fixation and comfort. Reversed they serve for the opposite limb. The leg band may be extended and turned over at its end which when fitted with a bar may be used for extension.

any patient, it can be used as a means of direct extension in any position of the limb, and it can be made for a few dollars by any machinist. With it any practitioner, no matter where situated, can treat fracture of the neck of the femur in abduction without keeping the patient in bed; and with very little skill he can obtain results which compare favorably with those of expert orthopedic surgeons.

These instruments are not shown with the intention of demonstrating their special merits. I claim for them no originality and there may be, and no doubt are, better ways of doing the same thing. They are presented simply to show that there are ways of treating fractures which are simple enough to be manipulated by the average practitioner.

In order, however, to apply either these or any other apparatus, the student must be taught the principles which underlie the mechanical treatment of fractures. As has been said, these are neither difficult to understand nor difficult to apply. Muscular contraction as the main cause of deformity and the position of relaxation which overcomes or

prevents it in both upper and the lower extremities can be taught the student in a few hours.

In addition he need only be taught the few remaining facts in regard to the pathology of fractures. In this connection not nearly enough stress is put upon the presence of the hematoma for good or evil. The extravasated blood certainly favors consolidation. On the other hand, a large hematoma exerts pressure upon the vessels and nerves, which may lead to trophic disturbance and to long continued disability even when the bones are firmly united. In such cases gentle massage that does not hurt the patient and does not materially move the fragments, is of great assistance in expediting the return of function.

So, too, the fact that fracture near the epiphysis is likely to lead to inflammation and rarefaction of the articular ends of the bones, reactive joint effusion and joint stiffness and the method of preventing the latter by gentle passive motion, is rarely emphasized except by those who specialize in the treatment of fractures by massage and passive motion.

None of the methods advocated are effective unless properly carried out. When the student is taught the indications he soon learns how to apply them. He must, however, be taught the methods based upon the mechanical condition to be met and suitable to the facilities he has at hand. With them he can and certainly will do good work when he goes into practice.

It should, therefore, be the aim of the surgical teacher to introduce methods which both improve and simplify the treatment of fractures. It is not by the refinements of surgical technic that the percentage of good functional results will be increased —the average practitioner cannot apply them—and the vast majority of patients derive no benefit from them. To do the greatest good the methods must be simple and practical enough to be within the scope of the great majority.

The choice of method in the treatment of fractures should depend not only upon the attainment of anatomical restoration. Other things being equal, the best method is the one which requires the least skill to carry out, is least likely to endanger the patient's life, or cause him pain, permits him to be about during convalescence, and leads to complete restoration of perfect function in the shortest possible time. If all the methods proposed for the treatment of fractures are examined and the results compared according to these indications, then the long continued controversy regarding the treatment of fractures will soon terminate.

THE EARLY DIAGNOSIS OF CANCER OF THE BREAST.*

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After looking through much of the recent literature on cancer of the breast, one is impressed with the emphasis that is given to the early diagnosis in these affections. It is estimated by Bloodgood,[1] of Halsted's Clinic, that over 80 per cent. of malignant tumors of the breast are cured when operated upon before a positive diagnosis of malignancy could have been made without operation, whereas cases presenting a complete picture (clinical) of malignancy gave less than 25 per cent. of cures. Since, then, the most satisfactory and successful treatment of malignant affections of the breast, known at the present time, is surgical, and since those operations performed at an early stage of the disease give by far the best results, it is obvious that the early recognition of these conditions is of the greatest importance.

Johnson[2] states that the occurrence of tumors of the breast is a hundred times more frequent in women than in men, and since the function of lactation plays an important rôle in the breast of the female, it is deemed expedient that this dicussion be limited to the affections of the female breast.

How, then, may the opportunity for early diagnosis in breast tumors be obtained?

Women must be educated not to regard lightly abnormal conditions or symptoms referable to their breasts, and already a propaganda has been inaugurated to accomplish this end.[3] In this way, the inoperable, primary condition of malignant disease of the breast will become less frequent, though it doubtless will not entirely disappear.

Up to the time of consultation, the responsibility in these cases rests with the patient, but beyond that time the responsibility is with the diagnostician. What does it avail a woman if, after she has been persuaded to consult her physician, she does not receive the benefits of diagnosis to which she is entitled? On the one hand, breasts and their lymphatics may be needlessly sacrificed, while, on the other, malignant growths are disseminated to form metastases, or they may ultimately recur at the operative site.

Then how may we best diagnose the tumors and other abnormalities of the female breast?

One is forced to depend upon the history, clinical signs and symptoms plus the macroscopic, and

*Read before the Medical Society of the County of Westchester, September 21, 1915.

in some instances the microscopic, examination (the latter by frozen section, at time of operation), in making the diagnosis of malignant disease of the breast, and in differentiating this from the various other affections to which this organ is prone.

Here let us note some of the views of a few who have contributed to the literature on this subject of clinical diagnosis of breast conditions.

In his recently published book, Taylor,[4] of New York, gives the five most frequent signs of cancer of the breast as follows:

1. Growth in breast.
2. Growth and pain.
3. Pain alone.
4. Retraction of the nipple.
5. Growth in axilla.

"One or another of these five symptoms," he says, "is the first sign of a carcinoma of the breast in 95 per cent. of the cases." (Referring to an analysis of 500 cases at the Middlesex Hospital, London.)

Kelly and Noble[5] say that "the diagnosis of malignant tumor is based upon the palpation of the tumor and the surrounding breast; changes in the skin and subcutaneous fat and the change in the nipple."

Cancer of the breast without tumor is scarcely to be considered, except as in an incipient or pre-cancerous stage, and as such does not admit of a diagnosis. However, of all breast tumors, it is estimated that 90 per cent. are malignant and that of these 80 per cent. are carcinomata.

Lyle,[6] in speaking of benign tumors of the breast, includes lipoma, angioma, enchondroma, endothelioma, and the fibro-epithelial tumors, and quotes Bloodgood as follows: "We regard every breast tumor as potentially malignant, and advise immediate removal."

On the other hand, Bainbridge[7] urges the importance of bearing in mind: (1) That causes other than malignancy may give rise to tumors in the breast; (2) that some of the so-called characteristic and classic signs of cancer, such as retraction of the nipple, elevation of the breast, and pain, may exist entirely independently of malignant involvement; (3) that by more careful diagnosis, unnecessary mutilation may often be obviated; (4) that certain special surgical principles should be employed in operating upon the breast if the prevention of cancer is to be fostered." "Local manifestations of other diseases," he states, "are always to be thought of in connection with tumors of the breast, notably, tuberculosis, syphilis, Hodgkin's disease (pseudoleukemia), and chronic intestinal stasis. It has long been known that the breast may be the seat of tumor formation in certain 'systemic' diseases, as well as in 'specific' affections, and yet it is by no means unusual for practitioners to refer patients to surgeons for the removal of the breast in cases which are amenable to treatment by other means, and in which such surgical intervention would entail unnecessary mutilation."

Lockwood,[8] consulting surgeon to St. Bartholomew's Hospital, London, begins his book on cancer of the breast with the following statement: "The method pursued has always been the same. First, the clinical examination, and afterwards the scientific microscopical investigation. The latter is done at the beginning of the operation and as soon as anesthesia is established. The extent of the operation is determined by the result. An innocent tumor is removed by a small, local incision; a malignant one by a complete extirpation." He emphasizes the value of the clinical observations, saying: "The microscopical diagnosis is made so easily that there is a danger lest by some it be allowed to overshadow the clinical diagnosis. But the importance of the clinical diagnosis cannot be overrated. Correct clinical observation followed by correct clinical reasoning may save the patient an unnecessary operation. He considers the age of the patient as an element in estimating the probabilities. A breast tumor in a young woman is more apt to be innocent than malignant. The chronic forms of mastitis become less frequent as age advances. Up to the age of 50, chronic mastitis seems, according to Lockwood, more likely to lead to a formation of cysts, but after 50 it is often associated with cancer.

"Inflammatory tumors of the breast usually cause pain and discomfort from their earliest stages. It is, of course, difficult or impossible to arrive at definite conclusions about subjective symptoms, such as pain or discomfort. Once a tumor is known to exist, the victim may imagine that it is painful. But subjective sensations are important, and ought not to be ignored or minimized. In the beginning, a malignant growth in the breast is, as a rule, free from pain. Later, when it has grown for months, sudden intermittent stabbing pain is felt, but this may be an early manifestation. Early and continuous pain may be felt when the tumor is inflammatory," also, "Inflammatory tumors of the breast are usually tender, while tumors both innocent and malignant seem to possess a peculiar insensibility. However, little reliance can be placed upon this sign," but, "when a lobe of the breast is chronically inflamed, then the tumor is often pyramidal with its apex toward the nipple and the base toward the

periphery of the breast. The apex of the pyramid may be felt joined to the nipple by a cord which is the inflamed and thickened duct."

The *rate* at which a tumor grows is usually a matter of conjecture. Cysts and innocent adenomata may grow rather quickly, while cancers that are ultimately fatal may be very slow. This author emphasizes, however, that the continuous growth of a tumor—whether the growth be fast or slow—should awaken suspicion. A cancer may actually become smaller, "but," he cautions, "the diminution in size is not to be trusted, the primary growth in the breast may cicatrize and diminish, while the growth is proceeding apace in the lymphatic glands."

Dimpling of the *skin* over the tumor of the breast, even when there is a small nodule present, should excite suspicion, but it should not be forgotten that this phenomenon may occur in connection with harmless tumors.

Enlargement of the axillary *lymph* glands is a diagnostic sign of value, to be sure, but its absence must not lead to error, for Lockwood says, "lymph glands which can neither be seen nor felt may be invaded in the very beginning." Besides the discovery of enlarged glands is difficult, and sometimes impossible, in stout patients. Furthermore, cancer does not always spread into the axillary glands. Inflammatory affections of the breast may be accompanied by enlargement of the axillary glands. They may be enlarged during pregnancy, too, when the mamary gland is undergoing evolution.

The presence of a tumor may not always be elicited by palpation and the consistency of the tumor may be misleading, for a tumor which fluctuates, and which is apt to be considered a cyst, may have a malignant papilloma growing into it, or carcinoma in its wall, or in the breast tissue near by. Such possibilities should not be overlooked.

Multiple tumors in the same breast favor benignancy, but Lockwood cautions against laying too much stress upon this sign. Simultaneous bilateral tumors, in his experience, are rare, but consecutive bilateral tumors are apt to be malignant. "The chances of cancer of one breast being followed by cancer of the other are not less than 5 per cent.," and, "putting cysts and mastitis aside, innocent tumors of the breast are seldom bilateral."

With reference to the situation of tumors, Lockwood says: "Cancers, like the innocent tumors, were met with rather oftener in the right breast, but the side in some of the earlier cases has not been noted. The preponderance of growths in the superior part of the mamary glands is somewhat remarkable. But that part of the breast is certainly more exposed to injury."

Cysts of the ampulla, while rare (about 2 per cent. of Lockwood's cases), may be either benign or malignant. The discharge from the nipple (the diagnostic sign) may be transparent and slightly viscid, or it may be sanious, more often the latter. "The presence of blood does not of necessity imply malignancy, but only that the intra-cystic growth is very vascular; it is, however, an element of suspicion."

He cited cases from which he concluded that "no tumor is to be felt, and there is no retraction of the nipple when a dilated ampulla contains an innocent papilloma; but when the intra-ampullary growth is malignant, a tumor may be felt and the nipple may be retracted. Apparently nothing is to be inferred as to the character of the growth from the nature of the discharge from the nipple."

Lockwood calls attention to the importance of diagnosing malignant affections of the nipple and areola because of their favorable situation, anatomically, for dissemination of the disease. Also to the fact that a malignant tumor may be encapsulated, hence one must guard against the error of taking it for granted that every encapsulated tumor is benign.

The last points, namely, the affection of the nipple and areola and the possibility of a malignant tumor being encapsulated, have been mentioned by Murphy,[9] of Chicago. According to this observer, cancer is often encapsulated, and is then the most dangerous lesion that occurs in the breast. In relation to "Paget's disease" of the nipple, he says: "This affection is more outrageously managed than any other disease of the mamary gland," an he emphasizes that it "is a cancer from the very first day that you see that little sore. It is the most wicked type of cancer which occurs in the breast." "Paget's cancer," as he prefers to call it, has a final cancer mortality of something over 90 per cent., as it is operated now. With reference to the microscopic diagnosis of cancer, Murphy always likes to see the gross specimen and to make his own interpretation of its appearance, and to contrast that with the interpretation of the pathologist. "When the clinical history," he says, "does not correspond with the microscopist's findings, then we usually side with the clinical history. Our observations have covered a number of years, so we have fairly positive convictions about it, based on the subsequent history of the cases. We always want the microscopist's report, and have the greatest respect for it, but it is only one of the elements in making a differential diagnosis, because we have tumors which, while microscopically malignant, are clinically benign and vice versa. Tumors are reported again and again as non-malignant and yet finally terminate the life

of the patient by recurrence, showing they were malignant. That is how we have come around to this conviction." He advises the removal of the tumor, if necessary, in order to make the diagnosis.

In this connection, Rodman,[10] of Philadelphia, holds that the only rational procedure is to remove all of the tumor, with a reasonable amount of surrounding tissues, and to submit all to the pathologist for an immediate report after making frozen sections. He thinks this the only way to make the diagnosis reasonably certain.

Cullen,[11] of Baltimore, calls attention to Bloodgood's work in this connection, as follows: "Bloodgood, after the most careful and painstaking study of the cases at the Johns Hopkins Hospital, has found that to remove a piece of cancerous breast for microscopical examination, and then delay several days for the report of the pathologist, is a most dangerous procedure, as nearly all these patients have a recurrence."

LABORATORY TESTS.

The *clinical* diagnosis of the tumors of the breast has presented so many difficulties and inaccuracies that an extensive literature has developed within recent years detailing the efforts to supplement or supplant the older method.

Kahn[12] has recently given a thorough digest of all these new tests, appending a comprehensive bibliography from which it is to be surmised that there is little to be hoped, in the near future, with regard to a dependable method for the early diagnosis of malignant neoplasms, and for the differentiation thereby of malignant from benign affections of the breast. It seems, however, that there is enough of encouragement in some of the lines of investigation to warrant research workers in continuing their efforts in the direction of discovering or perfecting one or more of the numerous methods which have been proposed.

Of the various tests and reactions suggested perhaps the one to which most attention has been devoted is the *Abderhalden* serum test. Contradictory results, as is usually the case with new methods, have been obtained by different observers. Goodman and Berkowitz,[13] in a series of cases of malignancy in which there were seven cases of cancer of the breast, obtained thirty reactions out of thirty-three cases in which the results corresponded to operative, postmortem, and clinical findings. Berghausen[14] reported positive reaction in some instances of suspected malignancy. He obtained better results, as a rule, when the tissues were selected from the region corresponding to that in which the cancer was suspected. Levin,[15] on the other hand, sums up his most recent contributions on the subject in the following discouraging words: "The analysis of the results of the present investigation seems to indicate that the more accurate and objective the test employed for the detection of the specific ferment reactions in the blood serum, the less difference can be detected between the reactions obtainable with normal and supposedly specific serums. The diagnostic value of the Abderhalden reaction in cancer is, therefore, to say the least, doubtful, and it must be stated very emphatically that for the present the method belongs to the research laboratory and not to the clinic."

Of the numerous urinary tests for early diagnosis of cancer, the reaction of Solomon and Saxl is among those most extensively tried. Goodridge and Kahn,[16] of the Biochemical Laboratories of Cornell University and Beth Israel Hospital, tested this method in a series of fifty-nine cases, among which were five cases of cancer of the breast. "In the results," they say, "for fifty-nine urinary examinations of cases of cancer, the colloidal-nitrogen per cent. was generally increased to as high as 5.75 per cent. of the total nitrogen, the minimum being 3.4 per cent. Fifty-eight of the fifty-nine cases of cancer gave a positive Solomon and Saxl reaction. We are doubtful whether the case in which it was negative was true malignancy, the diagnosis having been made clinically." This negative case was one of cancer of the stomach, presumably. The author concludes, "that positive results with either the colloidal-nitrogen test or the neutral-sulfur test alone are not indicative of carcinoma. When performed conjointly on urine of the same case, however, positive results with both methods are strongly indicative of malignancy."

Among the other tests for malignancy are the *carcinoma skin reaction* of Elsberg, Neuhof, and Goist, proposed in 1910; the *Vanslyke amino-nitrogen* determination; the *Wassermann* reaction; the *Ransohoff anaphylaxis* test, and the *Meisostagmin* reaction. Each of which has received its quota of attention, chiefly at the hands of laboratory investigators.

CONCLUSIONS.

From the foregoing, then, the following conclusions may be made:

(1) The *clinical* signs and *history* must form our basis for a diagnosis of malignancy in the breast.

(2) *Serology* and other general *laboratory* tests, as at present perfected, are not dependable for the diagnosis of these cases.

(3) Repeated examinations, at regular intervals, are desirable in doubtful breast tumors, But,

(4) The complete *clinical picture* should not be waited for before operation is advised.

(5) The influence of *physiological development* and *atrophy* of the breast, in which a tumor is present, should aways be kept in mind.

(6) Most tumors of the female breast at or near the *twentieth* year are benign, whereas, at or near the *fortieth* year, they are malignant.

(7) *Section through* or *into* the tissue of a tumor of the breast is never justifiable for the purpose of diagnosis. Well defined growths should include surrounding tissues when removed, but ill defined ones are best removed with one-fourth, one-half of the entire mamary gland.

(8) Gross examination of the *fresh specimen* by a well qualified pathologist, at the time of operation, is safer than the examination of *frozen sections* alone.

(9) We should not be content with a partial operation in breast tumors, if there is a question of malignancy. Only the removal of the lymphatics and the entire breast can effect a cure in these cases.

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PROSTATIC NODES—THEIR CLINICAL SIGNIFICANCE.

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Upon rectal examination the normal prostate imparts to the examining finger a uniformly smooth and even surface at both of its lobes and isthmus. It gently and gradually encroaches upon the rectal lumen, so that a perceptible projection is readily distinguished, but not enough to suggest an actual ridge or crest. Exceptions to this gross anatomical rule do occur, but in the large majority of cases the above delineation holds true.

Various diseases, such as gonorrhea, tuberculosis and malignancy may give rise to alterations in the anatomical contour of the gland. Without in the least under-estimating the gravity and importance of the latter two, I shall dwell mainly upon the former as an etiologic factor of moment in the causation of nodular formations in the prostate. It may be stated with certainty that seventy-five per cent. of all cases of prostatic nodes are the result of gonococcic invasion and form no inconsiderable contingent to the type of so-called chronic gonorrhea. Unhappily our medical nomenclature for centuries has been responsible for the ambiguity that still clings to the various descriptive terms, such as chronic gonorrhea, chronic urethritis, etc. A chronic gonorrhea or urethritis is not always a chronic involvement of the urethral canal, particularly so when induced by gonococcic prostatic infection or spermatocystitis of the same origin; it should be termed a gonococcic prostatitis, or prostatitis gonorrhoica.

When gonococci gain entrance into the ducts and crypts of the prostate through the process of extension, proliferation of the parenchymatous tissue takes place with a concomitant plastic exudate into the stroma of the gland, so that in the course of time nodes may develop in the substance of the prostate, particularly so in its lobes. Very rarely if ever, do we find the isthmus implicated. When such a prostate is examined—and for a proper and thorough examination we must dispense with finger cots, as they mar the sense of touch to no inconsiderable degree—instead of detecting a smooth and even surface, the finger readily recognizes elevations in the substance of the gland, prominences here and there, separated by normal prostatic tissue. If pressure is brought to bear upon these nodes —as they are termed—one of two kinds can be readily determined: soft, elastic and yielding prominences, the so-called *soft nodes;* or indurated, resisting and plastic ones—*hard nodes.*

The former are accompanied by a more or less copious discharge of prostatic fluid at the meatus, the latter yield very little or no secretion. The prostatic secretion thus obtained harbors numerous cocci, among which the gonococci are easily detected. It is often very difficult to obtain secretion for microscopic examination from the hard nodes.

Urethroscope examination, both anterior and posterior, is negative, and the only apparent evidence of gonococcic infection, therefore, is in the prostate. The urine of the patient suffering from soft prostatic nodes, upon a three- or five- glass test, may show flocculi and filaments, in the second and third tube (with preliminary irrigation), and in the forth and fifth tube upon prostatic massage. In those suffering from indurated nodes, the urine presents a negative character, so that little dependence is to be placed in such a case upon a three- or five-glass test. Ascitic agar cultures frequently yield colonies from the prostatic fluid expressed from the soft nodes.

The clinical significance of these nodes is obvious. While the patient may be entirely free from a urethral gonorrhea and the urethroscope fail to elicit any positive evidence of infection, the prostate is the organ that bears the brunt of the process. And this may continue indefinitely for years and years, with frequent recrudescences in the form of an acute specific urethritis, and a potent source of infection to others, a menace to the individual's health. For we cannot deny the fact that there is a constant absorption of gonotoxin, as has been proved by many observers, the effects of which manifest themselves in the form of different myalgias and arthralgias with no appreciable alterations in the muscles and joints thus affected. Other vague symptoms are complained of by the patient, which I believe have their origin in the prostatic lesions. Hence nodular involvment of the structure should always be considered of grave consequences and not lightly dealt with. Our conception of gonococcic infection in general may change radically within a decade or two. It is to be no longer regarded as a local affection only, but as a systemic disease of far-reaching importance.

Aside from being a source of absorption, the gonococcic nodes in the prostate vitally alter the prostatic secretion, a secretion so essential in the process of procreation, that sterility is one of the inevitable and sad results of such infection. It has long been determined that the seminal secretion without the admixture of the prostatic fluid loses one of its essential prerequisites in the process of impregnation. The spermatozoa without this auxiliary function of the secretion of the prostate are inactive. A pathological secretion of the prostate, therefore, is unable to activate the seminal fluid and sterility may thus be the outcome. Another function of the prostatic secretion that has not been universally recognized is its influence upon virility. While in a great measure the prostatic fluid is eliminated by ejaculation and unconsciously escapes with the urinary stream, and occasionally appears at the meatus, some of it is also absorbed and has a powerful effect upon sexual potency, not unlike that of the testicular secretion which has long been known to materially influence potency. An absence or pathologic modification of the prostatic secretion, either qualitatively or quantitatively, induced by gross morbid conditions of the gland will in time give rise to partial or complete impotence, aside from the mechanical rôle the prostatic fluid plays in activating the seminal secretion. Hence the clinical significance of prostatic nodes the result of gonorrheal infection, will become apparent to the practitioner at a glance, if he bears in mind the organic and functional disturbances they may create in the sexual sphere.

The treatment is unsatisfactory. If once the process has become localized in the prostate as foci and nodes, it is very difficult to eradicate it. Medicating the posterior urethra has been recommended with indifferent success, however. Likewise massage has proven futile in the majority of cases. Vaccinotherapy perhaps holds out some hope, if used early and systematically.

Of late operative interference has been advanced by some as a rational measure, and yet there are cases where prostatic drainage has availed but little and the patient has returned with the same gonorrheal discharge and the nodes still persisting after operation. Enucleation of the gland perhaps is the only logical measure. And yet there are objections even to that, if one bear in mind the functions of the prostate. No man desires to submit to an artificial impotence and sterility, even if it be only partial in character; in short, he does not want to be unsexed in a sense. If again we let the process continue unabated, its chronicity may be instrumental in causing enlargement of the gland in advanced middle age, when operation eventually becomes imperative. The treatment is problematical at its best. But if the process tends through its chronicity to induce enlargement of the gland in late years, enucleation is the only alternative.

To summarize:

1. Gonorrhea is the most common cause of prostatic nodes.

2. By reason of the latter the prostate is altered, both structurally and functionally.
3. The prostatic secretion produced under these circumstances is no longer a normal and physiological secretion.
4. As such it can no longer activate the spermatic fluid and the result may be sterility.
5. Furthermore, the normal prostatic secretion exerts a powerful influence upon virility, and if pathologically altered it may thus cause partial or complete impotence.
6. The prostatic nodes are sources of toxin absorption and responsible for the subsequent train of symptoms thus engendered.
7. The treatment is unsatisfactory and problematical.

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SURGICAL LONDON.

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To the average American London is always delightful. If he be a physician the pleasure is increased, for he soon realizes that here he can revel to his heart's content in a medical lore and tradition that dates back to the time when his own country was yet the home solely of the Red man.

As one roams from metropolitan hospital to hospital, and from school to school, one becomes fascinated not so much by what these represent today but by the unapproachable glory of their traditions.

One visits St. Thomas's and learns that it was at this institution that William Cheselden did some of those famous anatomical dissections which in 1711 brought down upon himself the censure of the dignified Company of Barber-Surgeons for "procuring the dead bodies of malefactors from the place of execution and dissecting the same at his own house."

Or at Bart's he is told it was while a surgeon there, in 1756, Percivall Pott, as a result of a fracture to his own leg, made a special study of that condition, which gave to the world the fracture that is still universally known by his name.

And so one passes from the stages which held John Hunter and his equally famous pupil, John Abernathy, the latter of whom established the Medical School at St. Bartholomew's Hospital; and Sir Astley Cooper, who organized the teaching department at Grey's.

He is still remembered as being the handsomest and most genial London surgeon of the early days of the last century, which are bridged to the present generation by memories of Sir Benjamin Brodie, Robert Liston, Sir James Paget and Joseph Lord Lister.

The generally accepted belief that Harley Street includes within its confines most of the best known surgeons of the metropolis is a mistaken one. While this thoroughfare still is preeminently given over to consultation rooms, it is by no means the Holy of Holies. I find that many of the most eminent surgeons live in other sections, although such adjoining streets as Wimpole Street and Cavendish Square are noted for names of international repute. In Cavendish Square are to be seen the plates of D'Arcy Power, Arbuthnot Lane and Victor Horsley, while at number one Wimpole Street is the magnificent home of the Royal Society of Medicine. The Royal College of Surgeons is some distance away. It is a noble structure, situated in Lincoln's Inn Field, off Kingsway. The Examination Hall, where examinations are held for diplomas of the Royal College of Physicians and Royal College of Surgeons, is situated in Queen Square, Bloomsbury, a secluded spot reached from Southampton Row.

London, naturally, supplies much of the medical instruction for the British Empire. The schools are part and parcel of the great hospitals, and as the clinical material is practically unlimited, students have full opportunity to become acquainted at first hand with the diseases they are taught. I was especially struck with the great amount of personal instruction in vogue. Much of the day's work of the advanced students consists in individual teaching. For instance, at Bart's the out-patients are utilized for instruction purposes to the fullest extent. The teacher selects half a dozen cases from among the patients. These are brought into the class-room. The several dressers have already gone over them thoroughly, and have written up complete histories. The patient is introduced to the class by the surgeon, who gives a brief outline of the case as related in the dresser's History Sheet.

I shall give in detail a day's work in the surgical department, which will best illustrate the thoroughness of the instruction given.

"Out-patients" are held daily. The class consists of several dressers, and perhaps a dozen past dressers. The student in charge of that particular patient gives in outline, without notes, his description. The case is that of a woman, aged 50, housewife. She has had six children, three now living. She has had three miscarriages. She appears healthy, etc., etc. He then relates what he has gathered from her own "personal narration," following which he states what "he himself has dis-

covered." Let us say the woman has a "lump" in her breast. He describes it on inspection. Next he states what he discovered on palpation. He gives the size, outline, consistency, states whether it is fluid or solid, smooth or irregular, hard or soft, even or nodular in outline; describes its shape, and finally gives its relation to surrounding structures. These details are gone over in a systematic manner so that the student soon acquires the necessary formulæ to be able methodically to go over his cases with a fine toothed comb, as it were.

Having thus finished, he announces his diagnosis. The instructor makes no comment on this, but very carefully questions the student as to his reasons for arriving at his conclusions. The student is "grilled" thoroughly, especial attention being paid to the anatomy and pathology as well as the surgery of the condition in point.

I found this kind of work most admirable. The co-relation and co-ordination of various branches compels the student to keep fresh in, and apply, the various subjects he has gone over in other departments, and impresses upon his mind the close relationship the different sciences bear to each other. For instance, the student has stated a case to be stone in the bladder, and has given his reasons for making that diagnosis. He will be quizzed on the urine of that particular bladder, its probable characteristics, its constituents, the various urinary tests, microscopical and chemical; the theories as to the causes given of the formation of stone, the various kinds of stone, and the treatment. If operative, the stages of the operation and the anatomy of the parts concerned are asked. During all this time he has the patient before him, and previously he has also personally instituted the various diagnostic procedures on this particular patient.

I am referring especially to the dressers. They are required to do six months of this work in the out-patient department in addition to dresserships in other departments and wards. As the classes are small, each student is called upon to go over every case, and in this very practical way the work done elsewhere is supplemented, reinforced and applied.

As might be expected, a feature of these out-patient classes is the difference of opinion developed over the same case. The instructor lends a willing ear to any student who can bolster up his case, providing he properly states his grounds. Each student has his day in court, as it were, but in the end the teacher announces his own decision. A most admirable feature is the readiness with which the surgeon acknowledges his mistakes. At the next meeting of the class he will probably display an *x*-ray plate which quite upsets his own previously made diagnosis, and if some student has had the good fortune to hit it when he himself missed, he graciously acknowledges it and bestows credit where credit is due.

But now let us make a visit to the wards. At 1:30 promptly in the afternoon each visiting surgeon meets his dressers in the Quadrangle preparatory to making the day's rounds.

The Quadrangle at St. Bartholomew's is an institution well worth more than passing comment. The hospital is perhaps the oldest in the world, for it dates back to the year 1123, and from its very beginning it has been used for the sick, never for an almshouse, as was common at that early period. Of modest proportions in the days of King Henry I, its growth through the centuries has been steady, until now it occupies several blocks in the very heart of the city, hardly more than a stone's throw from St. Paul's.

As the institution grew, a large courtyard was formed in its center, about which the various buildings have been constructed. The yard became known as the Quadrangle, and in rain or shine, snow or sleet, it is here that, at about 1:30 in the afternoon, congregate students and staff previous to starting on their rounds in the wards.

To an American, accustomed as he is to think of an Alma Mater dating back little more than a generation or two, these ancient structures prove awe-inspiring. As he stands in their shadows he catches a breath of days long gone and forgotten, and unless one is made of "stones and sticks or more than senseless things," he cannot help but be swayed by the quiet majesty of those somber piles which have looked down upon so many of the masters of our art during eight long centuries! For you realize that in this very place, three hundred years before the discovery of America by Columbus, still stood this venerable benefaction!

Only a cursory knowledge of the History of Medicine is necessary to muster up a few of the masters of our art whose memories yet lovingly cling to Bart's and its Quadrangle.

As you stand there on its asphalted pavements your mind's eye can see the discoverer of the circulation, the great Harvey, crossing to start on his rounds, looking neither to the right nor to the left, intent perhaps on tracing a stage in the age-puzzling blood-circle, the discovery of which was to make his name forever famous. His shadow has no sooner disappeared than you can imagine seeing Radcliffe and Mead, walking arm in arm, the latter no doubt telling a funny story, the former trying hard to look dignified but yielding in spite of all;

or John Freke, the Sergeant-Surgeon to Queen Anne, perhaps endeavoring to convince England that Queen Anne is really dead.

I have seen them all in the Quadrangle. The best days are the foggy ones, when you stand shivering in the cold damp atmosphere while Englishmen, bareheaded and perhaps in low shoes, hardly know that the temperature has fallen and a chill wind is blowing. But you can see these old Bart's men, nevertheless, in the shadows and in the mist, for there goes Percivall Pott quite near to you, and as the penetrating cold pierces your frame you easily imagine him with a hump to his back, and a projecting chest, and a hacking cough, the very picture of the thousand and one poor victims of Pott's disease you have perhaps seen. But suddenly the mist of London lifts just a little, the sun's rays glimmer, and Percivall no longer has a hump. He now is seen to limp. You look closely and know now that the limp is due to a fracture of the lower end of the fibula, and that the internal lateral ligament is ruptured, and perhaps the internal malleolus is broken off. Surely, you declare, our old friend has a Pott's fracture. Again the mist thins. Our friend of long ago has become erect, and you see him as he really was in the height of his reputation, handsome and dignified, wearing a long gray wig, a white, fluffy stock collar about his neck, and a magnificent velvet coat. He is perhaps accompanied by John Hunter, his pupil, whom he is probably gently chiding for his quarrelsomeness.

But these are no sooner vanished than the Pitcairns, William and David, materialize. David is pointing out for the first time in history the relationship between cardiac disease and acute rheumatism.

On their heels comes John Abernathy, followed at a respectful distance by his two pupils, Benjamin Brodie and the poet Shelley. You feel that at last here is your opportunity to find out what a Brodie's abscess really is, which again reminds you that you are as much in doubt also as to the real meaning of a Baker's cyst, when the shades of Morrant Baker appear.

You are beginning to wonder if there is no limit to the great names associated with the Quadrangle when over towards the Museum the shades formulate a new trio. It is Sir James Paget, accompanied by a man and woman. You think it is a man, but on closer inspection you see that it is only the skeleton of a man. The skeleton is that of the first case of osteitis deformans. The woman is proudly exhibiting the first described case of Paget's disease of the nipple.

But let it not be imagined that only ghosts appear on Bart's Quadrangle. One may see there in the flesh Sir Anthony Bowlby, the King's surgeon, and Sir W. P. Herringham, the King's physician, as well as D'Arcy Power, who, although one of London's busiest surgeons, finds time to qualify as the world's greatest authority on the history of medicine.

But let us leave the Quadrangle, having fallen in behind some particular surgeon, say Mr. D'Arcy Power, and make our way to his wards.

The dressers have during the early part of the day "dressed" the cases and written up a complete history of each case. Or they have assisted at the operation to the extent of preparing the patient, handling needles, or applying bandages. They have thus had an opportunity to observe the various stages of the operation so as to be in a position to thoroughly describe every step the surgeon has taken from the very beginning to the end. How well or illy the student has done this is demonstrated in the reading of the History Sheet. And if the account is not a correct one it must be rewritten since these papers become a part of the permanent records of the hospital.

The surgeon, standing at the head of the bed, is surrounded by his half-dozen dressers and perhaps as many or more additional students. Questions are hurled at everyone, and the ground covered includes, besides surgery, such subjects as anatomy, pathology and allied branches. The student may be required to detail the operation indicated; he may be asked to work out various incisions; he may be called upon to demonstrate his methods of palpation, or he may be invited to make a diagnosis.

In this department of surgical teaching I was again impressed with the great value of the correlation of all subjects. In the two hours of the round one has seen a series of cases, and the questions have brought out points covering all phases of surgery as well as allied branches.

I have no hesitancy in praising this method. Too much stress cannot be placed on the necessity of instilling into the minds of students the importance of thinking anatomically and pathologically when going over their surgery, emphasizing in this manner the bearing one subject has on the other or all the others. It is a mistaken notion that the one has no practical bearing on the other, or that they are only of use in the lecture hall, laboratory or dissecting room. It is a great mistake to permit the earlier branches to be pushed aside, or out of the student's mind, by the more advanced subjects as he reached the end of his curriculum. That the authorities on this side are quite alive to the importance is manifest in the character of the final examinations, which not only cover medicine and surgery

as such, but include quite a good deal of anatomy and pathology as well. This, notwithstanding the fact that the candidate has already passed a satisfactory examination in these minor branches.

St. Bartholomew's can boast of at least one institution which, as far as I know, is unique in medical schools. That is what is commonly known as surgical consultations. These have been going on uninterruptedly for half a century, and form one of the most interesting features of the place. Every Thursday afternoon at 1.30, each visiting surgeon, desiring the advice of his colleagues, brings before the advanced students a case which he feels needs clearing up. Attending are as many of the visiting and house staffs as are not urgently needed elsewhere. The surgeon in charge of the patient gives an outline of the case, asking at the same time that his colleagues assist him in arriving at a correct diagnosis, or advise treatment. Each surgeon, according to seniority, examines the patient, and the latter having been finally wheeled out of the room, the consultation begins. The senior member present first has his say, and this is continued until the most junior member has given his opinion. The cases are never common ones and are usually puzzlers. The purpose of these seem to be to assist in the clarification of knotty surgical problems while at the same time permitting the senior students to get an inkling into the difficulties of the art. The patient profits most, since he thus gets gratis the benefit of the advice of some of London't best surgeons.

I cannot say that the average student is always much the wiser after one of these meetings, for the differences of opinion expressed by their masters are naturally confusing. However, they form an instructive feature, and certainly they result in turning the searchlight, as it were, onto cases of an unusual character. The surgeon himself, no doubt, finds these consultations of value, especially when he is in some doubt as to the advisability of undertaking a radical operation.

Notwithstanding that many of the permanent staffs of the principal London hospitals are now at the front, the work of instruction is not apparently abridged. The difference is made up in a great measure by added work on the part of those remaining behind. It is probably true that three-fourths of all surgeons are in uniform, and those at home are doing their own work as well as that of the absent ones.

It is a commendable fact that despite the shortage of the teaching staffs there has been no lowering of the usual high grade of instruction.

AN IMPROVED AUTOMATIC SUCTION APPARATUS FOR SUPRAPUBIC CYSTOTOMY OPERATIONS.

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The problem of post-operative drainage of the urine in cases of suprapubic cystotomy has always been of the greatest interest, and many have been the devices resorted to in order to keep the patient dry and to enable the wound to heal as quickly and aseptically as possible. Unfortunately, up to the present time, no method has been found which could be relied upon to accomplish this result in every case, or which was not so complicated in its working as to require the constant attention of an assistant. For this reason, we feel justified in presenting the automatic apparatus which we have devised, and which we have found, after a considerable experience, very useful, simple and adaptable to all classes of wounds requiring regular and constant drainage of secretions.

To be useful, any machine or apparatus proposed for this purpose must fulfil the following requirements:

1. It must be simple in character and easy of operation.

2. Its operation must be painless and free of annoyance to the patient.

3. It must be capable of aspirating any and all secretions, regardless of specific gravity or amount, which might form or collect in wounds of this character.

4. It must be automatic, and must require the minimum amount of attention.

With these ideals in mind, and after much experimentation, we have succeeded in perfecting an apparatus which, while embodying no new principle, has proven of inestimable value, and which fulfils all the demands we have thus far made upon it.

Briefly described (see illustration) it consists of a specially built Kells suction motor pump, electrically driven and automatically controlled in its working by a specially fitted clock attachment, the latter being adjustable as to frequency of action and duration of suction. By means of specially devised points or tips, any wound or cavity may be drained as often and for as long an interval of time as may be required, with practically no inconvenience or discomfort to the patient.

For a more extended description, the apparatus may be discussed under three headings:

1. The suction apparatus.

2. The clock attachment controller.
3. The special points or tips.

1. THE SUCTION APPARATUS.

This consists of a small electric motor with a built-in suction pump (Kells improved type) of sufficient power to develop a vacuum of 12 inches or more. This is connected to a graduated gallon-jar container, which in turn is connected with the appropriate point or tip which is to be introduced into the wound or cavity to be drained. Between the pump and the vacuum jar is interposed a cotton filter jar for protection of the pump against moisture. The exhaust from the suction pump is carried through a specially arranged wash-bottle filled with permanganate of potash, which acts both as a deodorizer and as a muffler. The motor pump is almost noiseless in operation, and is practically non-heating, allowing of continuous use for long intervals of time when needed. We have run these pumps for periods of twenty-four hours at a time, with no overheating or wearing whatsoever. Both motor and pump are provided with specially arranged lubricating devices, rendering it easy to attend to the necessary oiling at regular intervals.

2. THE CLOCK ATTACHMENT CONTROLLER.

This consists of an automatic make-and-break wheel which is attached to ordinary clockworks, and which can be easily changed so as to allow of the substitution of various wheels, permitting a variety of frequent and long-continued periods of suctions as may be desired. In practice, we found that a suction period of ten to fifteen seconds every two or three minutes is sufficient for the average suprapubic cystotomy wound, the apparatus sucking from two to four ounces of fluid in this period of time. The controller is fitted with a special hand-controlled snap switch, which can be used by patient or nurse whenever it may be desired to work the motor at other than the automatic stated intervals, or when constant drainage is desired. The clockworks is of the eight-day variety, necessitating only a weekly winding by the attendant to keep it in action.

3. THE SPECIAL POINTS OR SUCTION TIPS.

We have allowed ourselves the greatest latitude in devising our tips, being guided largely by the individual cases on which we have tried the machine. The essentials are an outer perforated protecting tube, with an inner suction tube of a smaller caliber. The outer tube allows an entrance for air into the wound or cavity, prevents a vacuum, and protects the lining membrane against herniation or pinching by the suction tube. It also protects the suction tube against clogging. The inner tube is varied in size, depending on the character of the fluid to be aspirated. The two tubes may be made of any material, but we have found either rubber or round-ended metal tubing to answer best. Despite their rigid character, the metal tips have proved most useful, and have been very little more annoying to the patient than the more flexible rubber ones; they have also stood wear and tear to a much greater extent. Both tubes can be frequently taken out, cleaned, sterilized and reintroduced with very little pain or inconvenience. Sample tips are shown in Fig. 1, but any variety may be substituted, provided the necessary outer protecting tube and the inner suction one be incorporated.

TECHNIC OF APPLICATION IN SUPRAPUBIC PROSTATECTOMY.

After removal of the prostate by any of the usual procedures, a larger outer tube corresponding in diameter to the one-inch Freyer rubber tube is inserted into the bladder and strapped in by passing adhesive plaster strips over its outer flanges across the skin edge of the external wound. A ⅜-inch right-angled inner suction tube slightly shorter than the outer one is then dropped into this and connected to the vacuum bottle and the clock attachment controller is adjusted and started. The surrounding wound is lightly covered with sterile dressing, allowing free entrance of air into the outer metal tube. Automatically, the suction apparatus will drain all accumulated blood, blood clots, and urine at whatever interval of time for which the clock attachment has been adjusted, and no further attention is required. Drainage is kept up by this means for the first forty-eight or seventy-two hours, with scarcely any change of dressings or bed sheets being needed, and with merely an emptying of the vacuum bottle as it fills and an oiling of the

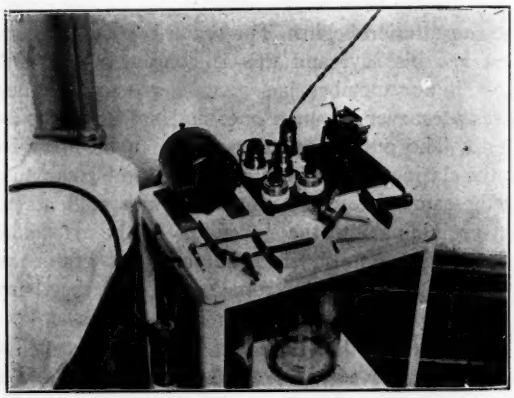

Fig. 1. Automatic clockwork controller, suction apparatus, and some special points or tips most frequently used.

motor and pump at twelve-hour intervals. The patient very quickly gets accustomed to the slight purring of the motor and, as rest in the recumbent position is an absolute requirement to avoid secondary hemorrhage, the large drainage tube is not as inconvenient to the patient as might be at first imagined.

At the end of forty-eight or seventy-two hours, as the case may be, the large outer tube and the corresponding inner suction tube are removed, the wound examined, and the next smaller sized point introduced into the bladder and connected with the aspirator. As often as desired thereafter the tips may be changed for smaller ones, allowing the wound to close down rapidly; about the fourth or fifth day it is sometimes advisable to use the rubber tips to permit of greater flexibility inside the wound, as the patient begins to sit up or move about the bed. Even then, however, we have found the rigid tubes

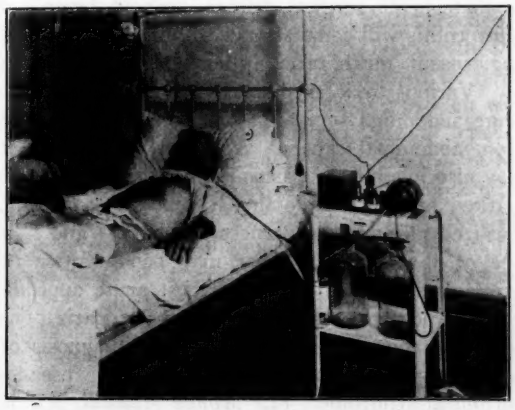

Fig. 2. Suction apparatus attached to patient and in operation. The hand switch control can be seen. Individual water cooler (improvised) for cases where attendance is of a limited amount, is seen hanging from the side of the bed.

to interfere so little with movement, that we frequently use them throughout. About the tenth or twelfth day the suprapubic wound, particularly if the two-stage operation has been done, has contracted to such a small size that it is more advisable to take out the suprapubic drain and insert a urethral retention catheter for a few days. This generally results in early closure of the suprapubic fistula.

Our experiences with this apparatus have so far proved invariably satisfactory. The patient is kept more thoroughly comfortable and dry, sometimes not having to be dressed or changed for forty-eight hours at a time. The wound being dry and free from gross urinary infection heals with less sloughing, greater rapidity, and firmer union. In charity clinics, where special nursing is limited in amount, the automatic character of the device is more highly appreciated by patient and attendant, and the expense of frequent changes of dressings, bed linen, etc., is kept to a minimum. By a simple device (Kells) we have succeeded in arranging the machine so that two patients in adjoining beds may be attached to one suction pump, thereby eliminating the necessity of a separate apparatus for each case.

Finally, we would say that, while we have found this suction apparatus of value in post-operative treatment, it is even more useful as an adjunct to operative work of almost every conceivable character. By means of the hand-control and with special suction tips, it can be used anywhere, and will be found unequaled for the evacuation of abscesses, cysts, etc., wherever met. We have not as yet found any body fluid, pathologic or normal, which cannot be aspirated perfectly and without leakage, provided the right suction point be employed. A special portable suction apparatus with both the automatic and hand-controlled switches has been devised for the surgical clinics, and has been found in some ways preferable to the above illustrated type as allowing of easier transportation from amphitheater to ward, etc.

THE SAMUEL D. GROSS PRIZE ($1,500).

This prize is awarded every five years to the writer of the best original essay, not exceeding one hundred and fifty printed pages, octavo, in length, illustrative of some subject in surgical pathology or surgical practice, founded upon original investigations, the candidates for the prize to be American citizens.

The competitor who receives the prize shall publish his essay in book form, and shall deposit one copy of the work in the Samuel D. Gross Library of the Philadelphia Academy of Surgery. On the title page, it shall be stated that to the essay was awarded the Samuel D. Gross Prize of the Philadelphia Academy of Surgery.

The essays, which must be written by a single author in the English language, should be sent to the "Trustees of the Samuel D. Gross Prize of the Philadelphia Academy of Surgery, care of the College of Physicians, 19 S. 22nd Street, Philadelphia," *on or before January 1, 1920.*

Each essay must be typewritten, distinguished by a motto, and accompanied by a sealed envelope bearing the same motto, containing the name and address of the writer. No envelope will be opened except that which accompanies the successful essay.

The committee reserves the right to make no award if the essays submitted are not considered worthy of the prize.

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, JUNE, 1916.

SIMULANTS OF ACUTE SURGICAL ABDOMINAL DISEASE.

In the consideration of an acute surgical abdominal affection the experienced practitioner will always have in mind and attempt rapidly to distinguish the various local conditions that may be at fault, according to the character of the signs and symptoms. Thus, before making a diagnosis of appendicitis he will try to eliminate, at least as probabilities, ureter stone, renal colic, tubal and ovarian disease, ileo-cecal tuberculosis or neoplasm. As regards acute appendicitis the diagnosis is most often correct; and in this and other acute surgical abdominal affections the establishment of the indication is more important than the pre-operative determination of the lesion.

There are, however, various extra-abdominal and various non-surgical affections that may closely simulate symptomatically, acute appendicitis and acute cholecystitis, and while this fact is generally known it often happens that the wrong diagnosis is made because these conditions are not borne in mind or are overlooked by reason of an incomplete examination.

It seems worth while, therefore, as a reminder, to refer to some of these non-surgical and extra-abdominal simulants of acute surgical abdominal disease. The abdominal pains and crises of tabes dorsalis often lead to the mistaken diagnosis of cholelithiasis or appendicitis and many unnecessary operations may be scored against the failure to exclude this spinal disease, as should always be done, before submitting a patient to the knife. Tumors, among other spinal cord diseases, may likewise cause deceiving abdominal symptoms. It is, of course, well known that pneumonia and pleurisy, at their outset, may be marked by symptoms apparently wholly abdominal and quite apt to suggest gall-bladder or other intraperitoneal disease. It is not so well known that malaria may produce, instead of, or in addition to, the characteristic chills and sweats, sharp abdominal symptoms, e. g., vomiting, fever, and localized right iliac pain and tenderness as in appendicitis, or upper abdominal pain and tenderness, even with jaundice, quite suggesting the diagnosis of cholelithiasis or pancreatitis. Acute myositis of the abdominal wall has also been described—a diagnosis to be made with much circumspection lest the opposite mistake be made of neglecting an urgent underlying affection.

Of the "medical" abdominal affections that may simulate acute surgical disease, typhoid fever and acute colitis will come at once to mind. Abdominal angiospasm, much rarer, is less apt to be thought of. Various toxic erythemata are accompanied by acute abdominal symptoms and sometimes proceed from abdominal causes. Acute urticaria, since it may also involve the gastro-intestinal tract, may be marked by sharp abdominal symptoms—vomiting, localized pain and tenderness and fever; and it is one of the conditions that may be forgotten or overlooked when the signs suggest acute appendicitis. Apert reports two cases of urticaria, one acute and one chronic, in which the diagnosis of acute appendicitis had been made on the pseudo-peritoneal syndrome. (*Le Monde Médical*, March, 1916.)

These, of course, do not complete the list of the occasional simulants of acute surgical abdominal disease. They are enough, however, to emphasize even for that very familiar affection, acute appendicitis, if not the Hippocratic saw, "diagnosis is difficult," at least that diagnosis should always include a process of elimination.

When we come to chronic abdominal affections and especially chronic appendicitis, the opportunities for mistakes, pardonable and otherwise, are many times greater.—W. M. B.

THE AMERICAN MEDICAL EDITORS ASSOCIATION.

The annual meeting and banquet of the American Medical Editors Association will be held at the Hotel McAlpin, New York City, October 25th and 26th, 1916, under the presidency of Dr. Edward C. Register, editor of *The Charlotte Medical Journal*.

SAMUEL M. BRICKNER.

Samuel M. Brickner, A.M., M.D., an associate editor of THE JOURNAL, died at Saranac Lake, N. Y., on May 5, after a long illness the inevitable end of which he faced courageously, uncomplainingly, even cheerfully.

His death at 49 is mourned by the host of colleagues, friends and patients who loved him. It is a loss to the profession which his scientific and literary attainments and his fine character adorned. He was an experienced gynecologist and had made notable contributions to obstetrics; but what is more important—for there are many to replace him in scientific work—he was in scholarship, temperament and character the type of physician of which we can not have enough. Gentle in spirit and demeanor, he was vigorous and active in the denunciation of professional misconduct and professional pettiness. And as he cherished and preached the highest ideals of his art, so, too, he cherished and cultivated the broader, cultural sides of that art.

His was a splendid example of devotion to responsibility in spite of illness, and of cheerful, helpful activity when illness overcame physical strength. With soldier-like bravery he continued the practice of his specialty for a full year after the recurrence of his malady told him that only by rest could he again become well. And when once more sequestered in Saranac Lake, spent in body and finally divorced from the clinical work he so loved, he called on the fine qualities of his intellect to continue the medical career which he was willing to terminate only with the death he calmly awaited. It was at this time that he joined the staff of THE JOURNAL, contributing abstracts of important gynecological and obstetrical articles. At this time, too, he edited, from its inception until his death, *The Medical Pickwick*, a literary magazine, unique in medical journalism, that has given pleasure to thousands. His editorials and his selection of contributed articles, historical, romantic, humorous, biographical, bespeak the man's culture and taste. *The Medical Pickwick* will long be associated in affectionate memory with him who gave it literary birth.

Dr. Brickner was a master of the epistolary art. Whether handwritten or dictated, his letters, always effortless, spontaneous, were remarkable for their diction, elegance and sentiment. His literary qualities are best known, however, by his verse. For this he possessed a talent which his long physical idleness gave him both the opportunity and the inspiration to indulge. During his illness he contributed several poems to lay publications, some of which have been widely quoted, notably "To R. L. S.," written for the dedication, at Saranac Lake, of the monument to Robert Louis Stevenson, "The Anti-Vivisectionist" and "The Red Cross Nurse." The finest of all of these, in sentiment, and certainly the most touching, was his valedictory, written very recently for the *N. Y. Times* and, at the author's request the day before he died, reprinted in the *Saranac Lake News*. He called it "The Feast:"

There is no more Lucullan feast than this
At which I daily sit;
Laughter and sunshine, love, a tender kiss—
These are the sweets of it.

If, by chance, black stormclouds lowly bend
My unresisting head,
It is no symbol that my joy shall end,
For still my feast is spread.

A day will come with laughter just as sweet,
The sun will fill the air,
Love still be young, but other lips will meet:
I shall have had my share!

SATISFACTORY IS NOT SATISFACTORY.

A typographical error occurred in the article in our last (May) issue by Dr. S. C. McCoy, to which he requests us to call attention. The last word in the first paragraph should have been *unsatisfactory* instead of *satisfactory*.

Here is a curious state of affairs: A word that is *satisfactory* is quite unsatisfactory, yet has to be made *unsatisfactory* in order to be satisfactory. When it was unsatisfactory it was *satisfactory* and now that we have made it more satisfactory it is entirely *unsatisfactory*. *Satisfactory* is unsatisfactory and *unsatisfactory* is satisfactory. What was *satisfactory* to our readers was unsatisfactory to the author and we can not make it satisfactory to him without making it *unsatisfactory* to everybody.

THE SOUTHERN HOSPITAL RECORD.

A new monthly has entered the field of medical journalism—*The Southern Hospital Record*, published at Atlanta, Ga., by Edward A. Werner and edited by him and Dr. Charles Edward Dowman. The first, and very attractive, issue, dated April, 1916, states as the purpose of the magazine to promote uniform efficiency in the hospitals of the Southern States. A perusal of this issue gives ample assurance that the new journal will indeed stimulate interest in hospital construction and administration; and we commend it to those of our Southern readers, especially, whose activities are associated with hospitals or private "infirmaries."

Surgical Sociology

Ira S. Wile, M. D., Department Editor.

INDUSTRIAL HYGIENE.

In a discussion of the subject of industrial hygiene, J. W. Schereschewsky (*Public Health Report*, October 1, 1915) lays particular stress upon the importance of education. In view of the fact that there are about thirty million industrial workers in this country subject to the influences of occupation, it is of immense importance that unfavorable influences, menacing the health of workmen, should be given full consideration by the medical profession.

It has been estimated that the average annual loss, through sickness, to workers in this country, approximates 8 or 9 days. Upon this basis an economic loss of $360,000,000 results if the annual earnings be placed at $600. It is unfortunate that the major portion of this loss is due to ignorance or carelessness.

To obviate the action of these two factors, it is necessary to undertake a comprehensive plan of education. This must extend to all classes in society taking in employers and employees and the general public whose aroused opinion is so potent a factor in securing constructive measures for the protection of workers.

The place which the medical profession is to take in the prevention of industrial accidents and diseases is by no means of minor significance. The great advances in industrial hygiene have to a large extent been dependent upon the information offered by the profession, though the application of the information has been made more generally by laymen. There has been, in a sense, a feeling of isolation of the general practitioner insofar as industrial accidents and diseases are concerned. Too frequently it has been regarded as a specific phase of medicine to be studied only by the specialist interested in the development of better industrial conditions. It must be recognized, however, that the vast majority of patients in any community necessarily come from the productive industrial classes.

The daily contact in hospitals and dispensaries with the victims of industrial accidents and diseases yields abundant opportunity for collecting information relative to the causation and results of life in the industrial world.

The clinical experiences, thus far largely uncollected, have not been related to occupation. Even the occupation of patients is frequently dismissed as a matter of secondary importance and not germane to the medical problem. Hospitals are particularly weak in that the data at present recorded are so vague as to be of little use. Its unreliability is in part dependent upon the fact that there is a lack of a uniform nomenclature to particularize the specific occupation of hospital patients. To classify a woman as a laundry worker is too indefinite to be of service. It is necessary to ascertain whether she be a sorter of soiled linen, a mangle operator, a marker, or indeed an office assistant. Similarly, the last occupation may not be the one responsible either for the condition of disease or disability. The lead worker, for example, who most recently has been employed as a bookkeeper might have his lead colic while in the latter position.

The clinics which provide remarkable clearing houses for information relative to industrial accidents and diseases for various reasons have failed to take advantage of their opportunities and thus the progress of industrial hygiene has been retarded. The organization of industrial clinics represents a step in advance. Although unfortunately other clinics may feel that it is no longer necessary for them to pay particular attention to this phase of medicine.

The educational advantage of the industrial clinic should be quite the reverse and serve to indicate to all clinics the importance of the subject and the responsibility of clinic assistants to collate all facts possible that may cast light upon this exceedingly important face of medicine.

Inasmuch as death certificates possess unusual functions in laying the foundation of constructive remedial measures, it is desirable that death certificates should state with exactness the occupation of the deceased. This is within the scope of activities of all physicians whether in hospitals or in general practice.

Thus far the medical institutions of this country have sadly omitted to give due attention in curricula to the influences of industries upon physical welfare. The time is approaching when those devoting themselves to the organization of medical schools must recognize the social and economic phases of medicine and inaugurate changes in the curriculum which will enable proper emphasis to be given to the large problems yoking together industrial life and health hazards. The relation of information of this character to surgical services is indicated by a study of any report on industrial accidents.

The report for the New York State Department of Labor for 1914 points out that in factories, mines, quarries, and building and engineering work over eighty-eight thousand non-fatal accidents were reported within a year. Power machinery was responsible for 26.7 per cent., weights and falling objects accounted for 24.4 per cent., hand tools 10.8 per cent., fall of the person 9.6 per cent., heat and electricity 6.9 per cent., vehicles and animals 2.5 per cent. Similarly for fatal industrial accidents mechanical power was the most serious instrumentality of death.

If the reports of the combined surgical services and hospitals of a large industrial city could be compiled to indicate the relation of the surgical condition to the particular employments of the victims, there would be abundant data to show what a large burden is shifted upon the public through the ignorance, indifference, or neglect of employers and employees. Industrial plants would stand out unfortunately prominent with unusually high accident rates. This might serve as a point of departure for the improvement of industrial conditions in specific trades and occupations and indeed even in particular factories, mines and shops.

Constructive work of this character is thoroughly in accord with the modern social principles of accident prevention. The maintenance of conditions conserving life and limb is a public duty and a responsibility of society. Here, too, the medical profession has a distinct contribution to make and it should be the first to appreciate its value and to correlate its experience with a view to establishing reliable figures.

By giving thought to this greatly neglected field of surgical sociology, it would be possible for the surgical fraternity to point out many of the shortcomings of our industrial system and to stimulate sound legislation designed to afford greater protection to industrial workers. Herein is a broad field for the surgical pioneer whose social mind can grasp his potential service to the community.

Book Reviews

A Text-Book of Fractures and Dislocations, With Special Reference to Their Pathology, Diagnosis and Treatment. By Kellogg Speed, S.B., M.D., F.A.C.S., Associate in Surgery, Northwestern University Medical School; Associate Surgeon, Mercy Hospital; Attending Surgeon, Cook County and Provident Hospitals, Chicago, Ill. Octavo; 888 pages; 656 illustrations. Philadelphia and New York: Lea & Febiger, 1916. Cloth, $6.00, net.

A perusal of this interesting volume, the latest work on fractures and dislocations, reveals two features that strongly commend it: the author has based it on a large personal experience, competently studied; he has conscientiously combed the literature of his subjects and included most of the important and useful contributions thereto. The work is, therefore, quite up-to-date and authoritative. It presents a third, and quite distinctive feature—a mechanical one: in place of the roentgenograms one expects to find in such a book today, some of which always are unsatisfactory, the author has illustrated it with admirable shaded tracings of actual roentgenograms, made under his supervision by Mr. Streedain. These are all clear, sharp and well executed and enhance both the appearance of the book and its teaching value. In the section on *pathological fracture,* however, it was a mistake, in our opinion, to substitute sketches for roentgenograms. These sketches cannot, certainly they do not, indicate those features by which, roentgenographically, medullary sarcoma, periosteal sarcoma, carcinoma, cyst, gumma, tuberculosis and pyogenic osteomyelitis can be differentiated.

Speed states that "syphilis itself rarely leads to pathological fracture. The bone changes are almost always hypertrophic in character, and shafts are greatly thickened." This is quite true, but it does not take into account the gumma which causes destruction as well as production of bone and thus occasionally produces a pathological fracture—more often, probably, than is generally believed, since the condition is apt to be mistaken for a neoplasm.

We are interested to note that Speed is one of the few who take issue with the teaching of older authorities that primary uncomplicated traumatic subluxation of the shoulder cannot occur. He has seen two cases (in one of which, however, he found on operation a slight mashing and overgrowth of the glenoid rim). But he is in error in stating that Stimson and Hamilton believe uncomplicated traumatic shoulder subluxation occurs; or perhaps the printer omitted the words "do not."

Not so much by way of criticism as to indicate the character of this work, it must be said that it appears (and perhaps was intended) to be more useful as a reference for the experienced practitioner than as a practical guide for the student and novice. The chapter on *symptoms, signs and diagnosis of fracture* is very brief and the section on diagnosis in general occupies less than two pages, one of which is devoted to roentgenography. Neither in this chapter nor elsewhere in the book is there any picture illustrating the method of examining an injured extremity, as for fracture or dislocation of the elbow. The scant section on plaster of Paris says not a word about the making and storing of plaster bandages—a most important matter—and neither in this section nor elsewhere is there a photograph to show what a good molded plaster splint or a good plaster cast should look like. Indeed, the book is strangely lacking in illustrations of splints, casts and other fracture apparatus—a serious defect, surely, from the standpoint of the inexperienced seeking practical information. Equally disappointing, from that standpoint, is the scarcity of photographs showing the deformity produced by various fractures and dislocations. In the text, too, clinical diagnosis might well have received more extended consideration. The mechanism of each fracture and dislocation is, however, carefully described.

Speed is an advocate of metal bone plating and of metal nailing. He presents a table of fracture cases operated upon at the Cook County Hospital and discharged during 1914 and the early part of 1915. We counted among these 42 Lane platings. Of these the "result as to function" was "perfect" in 1, "good" in 19, "fair" in 3, poor in 8 (non-union in 2; 2 "still discharging"), "recovery" in 2, not stated in 6 (1 left the hospital too early, 1 on crutches), died, 2. Nine of these 42 cases became infected. On their face these statistics do not seem to us to make a showing for metal plating that can arouse much enthusiasm. With nails and screws alone the results were better. Of 12 such operations the results were: "very good," 3; "good," 5; "fair," 2. In one case the nail was removed; result not stated. In one the result is given as "good."

Speed acknowledges the merits of Albee's methods, but his table does not indicate that they were much employed during that period of time.

The results of intramedullary splinting appear to have been, most of them, very good.

It is a pity that in a work in which so many authors are quoted their names are not included in the index. The failure to index them is a serious omission since it limits the usefulness of the work for reference purposes.

Such shortcomings as we have pointed out can be corrected in a later edition, and the excellence of this volume gives promise that a second edition will be needed.

Oral Surgery: A Treatise on the Diseases, Injuries and Malformations of the Mouth and Associated Parts. By Truman W. Brophy, M.D., D.D.S., LL.D., Sc.D., F.A.C.S., President and Professor of Oral Surgery, Chicago College of Dental Surgery; President International Dental Federation; Member American Medical Association, National Dental Association; Honorary Member of all National Dental Associations of Continental Europe, North America and Several Other Countries; Medalist, Odontological Societies of Paris and Italy, and of New York State Dental Society; Oral Surgeon to St. Joseph's, Michael Reese and Other Chicago Hospitals; Consulting Oral Surgeon, Presbyterian Hospital, etc. With special chapters by Matthew H. Cryer, M.D.; G. Hudson Makuen, M.D.; William J. Younger, M.D.; F. W. Belknap, M.D., and Calvin S. Case, M.D., D.D.S. Large octavo; 1090 pages; 909 illustrations, including 39 colored plates. Philadelphia: P. Blakiston's Sons & Co., 1915. Cloth $10.00 net.

This is a massive, indeed a monumental work. Few other men than Brophy are competent, by experience, to write it. It covers all the surgical affections of the mouth and jaws, the pharynx and the salivary system, and it covers them exhaustively and with voluminous references to the literature. How thoroughly these subjects are discussed may be gathered from the fact that of the more than one thousand large pages in this big volume

only eighty are devoted to dental surgery (dento-alveolitis, extraction of teeth, transplantation of teeth). About sixty pages are devoted to harelip, and one hundred and seventy to cleft-palate, by his operation for which Brophy is best known. He also describes in detail other procedures than his, however, especially Lane's.

The work is remarkable in its completeness. It is, indeed, almost encyclopedic. As indicated above, some of the special chapters have been contributed by other writers.

The book might well have been reduced in size by condensing the first thirteen chapters (236 pages)—bacteriology, special infections, syphilis, tuberculosis, immunity, tumors, wounds, asepsis and antisepsis, anesthesia, injuries and diseases of blood vessels, fractures and dislocations in general, etc.—to a consideration of these subjects as applied to oral surgery. Thus, in the chapter on anesthesia, the historical paragraph is unnecessary and the paragraph on spinal anesthesia is out of place; a chapter on the diagnosis of oral syphilis would have been more appropriate than the sketchy chapter on syphilis in general; and of these other chapters, likewise, much might have been omitted that is to be found in text-books of general surgery. Brophy explains, however, that these chapters were written for the benefit of the dental student.

The illustrations, over 900, are very good. Many are borrowed from various sources. The others are radiograms, numerous photographs, and some excellent drawings by Zan D. Klopper. The colored drawings were a waste of money. Some of them are grotesque; all of them are unsatisfactory.

It was in 1886 that Brophy was appointed by the National Association of Dental Faculties to write a book on oral surgery. During the thirty years that have elapsed he has been accumulating the illustrations, the experience and the wisdom that is in this treatise; and we may be grateful, indeed, that he took ample time in the preparation of so important a work.

Manual of Operative Surgery. By JOHN FAIRBAIRN BINNIE, A.M., C.M. (Aberdeen), F.A.C.S., Surgeon to the Christian Church, German and General Hospitals, Kansas City, Mo.; Fellow of the American Surgical Association; Membre de Société Internationale de Chirurgie. *Seventh Edition,* revised and enlarged. Large octavo; 1363 pages; 1597 illustrations, some in colors. Philadelphia: P. BLAKISTON'S SON & Co., 1916. Cloth, $7.50.

In the dozen years Binnie's Operative Surgery has been before the profession, first as a very small, incomplete manual, it has grown steadily in size and in importance, until it has become as nearly indispensable a reference work as such a book can be. From the outset it has been Binnie's plan to deal especially with the more unusual operations, thus to afford much information not to be found in most text-books of operative surgery and, as the author puts it, "to give aid to the surgeon when he is in trouble." While he has not by any means neglected the classical and the "every day" operations, Binnie has continued to emphasize the rarer procedures, and his work is accordingly distinctive. It is, moreover, precise and painstaking in description and, it seems to us, altogether sound and reliable.

Comparison with the sixth edition shows a general, conscientious revision and the inclusion of the most important newer operations and operative methods. In the new section on indirect transfusion of blood, however, there is no reference to the methods of Lewisohn (citration) and of Unger, which are the simplest of all. The new section on cardiac surgery is quite brief. Rather brief, too, for a work of this character, are the sections on other intrathoracic operations, the technics of which, however, are still in the making.

There is an interesting Appendix on War Surgery by Walter S. Sutton.

The index is very full, occupying nearly fifty pages, but is not over-elaborated. It contains, however, many typographical errors.

A Manual of Gynecology and Pelvic Surgery for Students and Practioners. By ROLAND E. SKEEL, A.M., M.D., Associate Clinical Professor of Gynecology, Medical School of Western Reserve University; Visiting Surgeon and Gynecologist to St. Luke's Hospital, Cleveland, etc. Duodecimo; 680 pages; 289 illustrations. Philadelphia: P. BLAKISTON'S SON & Co., 1916. $3.00 net.

This is a very handy and attractive manual, and has several features to commend it. As one reads through its pages, one is struck by familiar subjects, those which came up for consideration in daily practice. Especial attention is given the matters of diagnosis and treatment. Ample illustrations serve to make the text clearer, while the latter is itself concise and clear. A rather extensive bibliography is appended to each chapter. No attempt has been made to correlate in the text references in medical literature with their particular content. Nor is the list of authors complete; it lacks a number of very important ones. Yet for the reader who is interested in further studying a given chapter in gynecology the bibliography may serve as a good working reference.

In the matter of pathology the book has not been so fortunate. The photomicrographs are not well chosen as types of disease, nor are they up to date. The picture of interstitial endometritis, for example, shows an unmistakable status premenstrualis which is not at all suggested in the description. Gynecologic pathology has made many strides in the past decade, particularly in cyclical changes of the endometrium, and it behooves authors of new text-books to be at least familiar with the more important ones.

Surgery in War. By ALFRED J. HULL, F.R.C.S., Major, Royal Army Medical Corps, Surgeon British Expeditionary Force in France; Late Lecturer on Surgical Pathology, Royal Army Medical College, Millbank, etc. With a preface by SIR ALFRED KEOGH, K.C.B., M.D., Hon. Physician to H. M. the King. Duodecimo; 405 pages; 26 plates and 55 text figures. Philadelphia: P. BLAKISTON'S SONS & COMPANY, 1916.

This small manual is an interesting presentation, in a condensed form, of the treatment of war injuries, as elaborated by Sir Almoth E. Wright and others of the British Army Medical Corps. Several of the chapters are contributed by authors other than Hull.

Practical Dietetics with Reference to Diet in Disease By ALIDA FRANCES PATTEE, Late Instructor in Dietetics, Bellevue Training Schools for Nurses, Bellevue Hospital, New York City; Former Instructor at Mount Sinai, Hahnemann, and The Flower Hospital Training Schools for Nurses, New York City; Lakeside, St. Mary's Trinity and Wisconsin Training School for Nurses, Milwaukee, Wis.; St. Joseph's Hospital, Chicago, Ill.; St. Vincent de Paul Hospital, Brockville, Ontario, Canada. *Tenth Edition,* revised and enlarged. Duodecimo; 466 pages and two indices. Mt. Vernon, N. Y. A. F. PATTEE, 1916. $1.50.

This familiar and excellent book needs no further description. This edition shows various changes, the section on infant feeding, especially, having been largely rewritten and expanded. It is a bit amusing that chapter 23, devoted to the diet of the adolescent and the aged, should also bear the running head "Infant Feeding."

The Influence of Joy. By GEORGE VAN NESS DEARBORN, Instructor in Psychology and Education, Sargent Normal School, Cambridge; Psychologist and Physiologist to the Forsyth Dental Infirmary for Children, Boston, etc. Edited by H. ADDINGTON BRUCE, A.M. *Mind and Health Series.* Duodecimo; 223 pages. Boston: LITTLE, BROWN & COMPANY, 1916.

Though adding nothing new to James's psychology of the emotions, this volume serves to emphasize their physiological side, showing that joy makes for health and achievement.

Progress in Surgery

A Résumé of Recent Literature.

Spasm of the Stomach and Duodenum from a Roentgenologic Point of View. R. D. CARMAN, Rochester, Minn. *Journal of the American Medical Association,* April 22, 1916.

The stomach is the favorite playground of spasms, either of intrinsic or extrinsic origin. The intrinsically caused spasms are generally due to ulcer, less often to cancer, and three forms due to the former cause may be distinguished, namely: (1) the incisura or hour-glass stomach; (2) diffuse spastic distortion, and (3) spasm of the pyloric sphincter. These are described as regards their appearance under the rays. Cancer may also produce more or less spastic distortion aside from its filling defect due to the tumor mass, and some of these may resemble that from ulcer. Duodenal ulcer is occasionally associated with gastric incisura or hour-glass stomach and a spastic filling defect of extrinsic origin in the pyloric end of the stomach is equally misleading. Pylorospasm due to diseased gallbladder or appendix is also noted, and extrinsic spasm may be total instead of localized, giving a contracted tense and inactive organ with little secretion as a rule. The causative agents of extrinsic gastric spasm are hard to prove definitely and as probable causes are enumerated hysteria, pancreatic disease, tabes, abdominal arteriosclerosis, calculi, uremia, and poisoning by lead, nicotin and morphin. A condition like gastrospasm may be produced in emotional disturbances by strong refraction of the abdominal wall and relieved when the fear or nervousness has disappeared. The diagnosis of gastrospasm from organic disease is best carried out by exclusion. If due to organic lesion the deformity is persistent, localized and unvarying. Sometimes a palpable mass from a new growth may be detected and if the lumen near the pylorus is markedly encroached on by an organic lesion obstruction will be shown to a six-hour meal. Spasm resulting directly from an ulcer or cancer is usually seen in the segment involved. Intrinsic spasm tends to persist at subsequent examinations and is unaffected by antispasmodics. Indirect, remotely caused gastrospasm is often brief in duration or intermittent, and may show changing aspects. Diffuse extrinsic spasm tends to accelerate gastric motility rather than retard it and remotely reflected spasm is likely to be missing at any second examination and disappear with the use of an antispasmodic. These rules are not absolutely inflexible, but serve in a general way. Carman has had the best results from giving belladonna tincture, from 15 to 20 drops three times daily for three or two days, and then re-examining. The physiologic effects of the dose are necessary for the examination to be conclusive. General anesthesia causes any form of spasm to disappear. In the duodenum a probable form of intrinsic spasm not hitherto emphasized is that accompanying duodenal ulcer. Deformity of the bulb has generally been attributed to the ulcer or its scar, but Carman mentions the following phenomena as deserving consideration: "1. In those cases in which organic distortion is present, the deformity noted at the Roentgen examination often far exceeds the deformity found at operation. 2. Cases are seen occasionally in which the ulcer or its scar as found at operation is small and quite insufficient of itself to produce a recognizable filling defect in the roentgenogram. This fact made us very skeptical for some time of the validity of Cole's sign. However, these cases do frequently show pronounced irregularity of the bulbar shadow, and this must be due to some cause other than the organic alteration of the bulbar wall. 3. In the above described type, on plates made in the dorsoventral position, the disfigurement is seen on the lateral borders of the bulb, although the ulcer is usually situated on the anterior wall. 4. The bulbar distortion often displays other characteristics of spasm. It is clean-cut in outline, projects deeply into the bulbar lumen, and is wholly comparable to the incisura of gastric ulcer. 5. That duodenal ulcer, like other ulcers, is an efficient spasm-producing agent is indicated by its association with spasm in the stomach and elsewhere."

Experimental Studies in the Production of Chronic Gastric Ulcer. A. O. WILENSKY and S. GEIST, New York. *Journal of the American Medical Association,* April 29, 1916.

Wilensky and Geist report experimental studies on the production of chronic gastric ulcer in cats after first studying the healing of surgical injuries in a number of the animals. They found that the surgical lesions healed completely in from one to two weeks and the contraction of the stomach wall tended to make the defect smaller. In their experimental production of gastric ulcer the abdomen was opened in the middle line, the stomach pulled out and an incision into it made parallel to and near the major curvature so as to enable one to evert the mucous membrane along the lesser curvature. The defects were made by excising tissue of the stomach wall down to and including part of the muscularis and measured from 1 to 2 cm. in diameter. The bacteria used were injected into the tissue layers and were obtained from cultures of human gastric ulcer excised in operations. The animals were returned to cages and fed much as usual and ate freely in from twenty to forty-eight hours, not losing weight appreciably. The stomachs were inspected at various periods afterward and it was found that the surgical defects healed as promptly in the injected animals as in the controls. Their experiments, they say, demonstrate that the presence of organisms (streptococci), taken from human gastric ulcers has no effect in producing in cats defects with characteristics of the chronic indurated ulcer of man or in retarding the healing of the injected lesions.

The Antiseptic Action of Ether in Peritoneal Infections. J. SALIBA, Elizabeth City, N. C. *Journal of the American Medical Association,* April 22, 1916.

Saliba reports his experience with the use of ether in peritoneal infections. When introduced into the peritoneal cavity it acts in both its liquid and its gaseous form, and its absorption and evaporation are very rapid. He has used it as a routine in all cases of peritoneal infection that came under his care for over a year at the Elizabeth City Hospital, continuing the employment of proctoclysis and Fowler's position in the after-treatment. By means of small sterile canula attached to a record syringe containing the dose of ether and inserted immediately before the continuous suture of the peritoneum has been tied, he instils the ether into the peritoneal cavity and then sutures the wound in the parietes. When drainage is used, he injects ether through the drainage tube and clamps it for four hours. His youngest patient thus treated was five years old and the amount injected 1 ounce. In adult cases he never injects more than 3 ounces and in only one case did he give a second injection on the fourth day. No untoward after-effects of the ether were observed in any of his cases. Five cases of appendicitis showing the results are reported. He concludes that ether has a bactericidal action and is a safe and beneficial antiseptic in peritoneal infections. Any possible toxic action of the ether is very slight.

Penetrating Wounds of the Abdomen. J. FRASER and H. T. BAKER. *British Medical Journal,* April 8, 1916.

The observations are based on a large experience at the front. The authors are convinced that in the vast majority of penetrating wounds of the abdomen operation is necessary. It is only in the rarest instances of injury to the hollow viscera that spontaneous recovery occurs. The only pre-operation treatment the authors give is to keep the patient warm and administering 1 c.c. of pituitary extract. During the operation saline solution is given subcutaneously. The closed ether method of anesthesia, in the authors' opinion, gives the least shock. The authors describe their method of exploration, which does not differ from that conventionally employed. Speed is an important factor.

Final Results in Twelve Cases of Colectomy. JOHN G. CLARK, Philadelphia. *Surgery, Gynecology and Obstetrics,* May, 1916.

In only 6 of the 12 cases operated upon by Clark may one consider the resutls as entirely satisfactory. In all cases there was great improvement of the constipation for a time, to be followed at variable intervals in four by a gradual recurrence of the constipation. In some cases this has not been so severe as formerly, whereas in others it is quite as intense. *X*-ray examinations in three cases showed in two decided dilatation of the ileum to a size closely resembling that of the colon. None of these cases showed diarrhea of long standing, and in all this could be controlled by simple medicinal measures. Thirst has not been undue in degree in any of these cases. In six cases the general nutrition was markedly improved. In the remainder there was no visible effect so far as physical improvement is concerned.

The author feels as a final summary of these cases that total removal of the colon is justifiable only in severe cases of obstructive constipation. The immediate danger of the operation and the serious sequelae that may follow weeks or months later make it, however, too hazardous to extend it into the wider fields so ardently advocated by Lane and his enthusiastic followers. It may be efficacious if carefully restricted, but it possesses no miraculous function. The ileum does not uniformly assume the vicarious function of the colon; in a definite proportion of cases the backward pressure from the colon through the anastamotic opening when it is low down causes dilatation and permanent impairment of the ileum.

A Clinical Contribution to the Evaluation of Occult Blood in Stomach Contents and Stool in the Diagnosis of Stomach Carcinoma. (*Ein klinischer Beitrag zur Bewertung des Nachweises okkulten Blutes in Mageninhalt und Stuhl für die Diagnose des Magenkarzinoms.*) JOSEF EMMERT, *Münchener Medizinische Wochenschrift,* March 7, 1916.

In 21 cases of carcinoma ventriculi, the positive finding of blood in the stool and gastric contents exceeds in frequency all other signs of carcinoma; only in one case was this not true. This symptom is comparatively early and is probably present when the patient consults the physician for stomach symptoms. In one instance the guaiac test proved positive when symptoms had lasted altogether only four weeks. At operation an area of cancerous involvement the size of a silver dollar was found. Since the finding of blood in gastric contents is constant in cases of carcinoma ventriculi, a single negative finding with the guaiac test would make the diagnosis of a stomach cancer highly improbable. In the 20 cases there never was a single instance in which the text was negative. And this is true after operation even when a wide gastroenterostomy had been made and strict regulations of the diet practiced.

A Preliminary Report Concerning the Effect of Foreign Substances in the Peritoneal Cavity. WILLIAM R. CUBBINS and JOSEPH A. ABT, *Surgery, Gynecology and Obstetrics,* May, 1916.

The authors tested the value of certain substances in the prevention of peritoneal adhesions. They found that the tincture of iodine, sulphuric ether, commercial vaseline, liquid albolene, white vaseline, Russian mineral oil, olive oil, almond oil and lanolin were all useless in the prevention of adhesions. While some of these substances, as sulphuric ether and the tincture of iodine, were highly toxic and lethal for the dogs, the others were all irritants resulting in more or less extensive, more or less coarse or fine adhesions within the peritoneal cavity. Liquid paraffin is relatively non-absorbable, being retained in its original state for varying periods; but it will not prevent adhesions.

Free Transplantation of Fascia Lata in the Treatment of Inguinal Hernia. By FRANCIS T. STEWART, Philadelphia. *Pennsylvania Medical Journal,* April, 1916.

In dealing with an indirect hernia the cremasteric fascia and the infundibuliform fascia are incised in the axis of the spermatic cord, the sac isolated, ligated and excised; and its stump transferred and fastened to the under surface of the transversalis fascia, above and to the outer side of the internal inguinal ring, by passing one end of the ligature through the fascia and the muscles at this point. The edges of the transversalis fascia are seized with forceps and everted. When the hernia is large the transversalis fascia in the neighborhood of the internal ring above the cord is often so attenuated as to be difficult of recognition; in these cases it may be traced from the lower margin of the ring, which can always be felt as a sharp band below the cord. The size of the transplant required is now estimated, the lower margin of the cutaneous incision undermined, and the transplant excised from the fascia lata below Poupart's ligament, between the external cutaneous nerve and the branches of the anterior crural nerve. The transplant is immediately sutured with catgut to the under surface of the everted margins of the transversalis fascia; *i. e.,* the everted margins of the internal ring above the cord. The edges of the transversalis fascia are then united over the transplant.

When the hernia is a direct one the cremasteric fascia is incised to the inner side of the cord, the transversalis fascia in Hesselbach's triangle opened, and the peritoneal sac removed, the stump of the sac being fastened to the under surface of the transversalis fascia above and to the inner side of the triangle. The transplant is then sutured to the under surface of the transversalis fascia, which is subsequently overlapped.

A Report of a Series of Unusual Fecal and Genito-Urinary Cases Treated with Bismuth Paste. EMIL G. BECK, Chicago. *Surgery, Gynecology and Obstetrics,* May, 1916.

Beck reports a series of cases of fecal and genito-urinary fistulæ of the most complicated variety that previously failed of healing though several attempts at surgical closure were made. By injections of bismuth paste in various concentrations at least 65 per cent. of these fistulæ may be made to heal. The bismuth paste forms an aseptic coating to the fistulous tract, protects the granulations from the infective material, and permits the fistula to fill in and close up. The best results are obtained by injecting the paste into every crevice and ramification of the fistulæ. Frequently surprising pictures are presented in the roentgenogram, resulting in the detection of the underlying diseased focus in a remote organ or region of the body. Thus one case of supposed rectal fistula proved to be an abscess resulting from tuberculosis of the eleventh dorsal vertebra.

In only one class of sinuses must great care be taken not to inject too large a quantity of the paste, and that is into large pus pockets where the bismuth may remain a long time and cause poisoning by absorption. Of a series of 1,800 cases, Beck has not had a single fatality resulting from bismuth injection. Where poisoning is feared the fistulæ should be filled with *warm olive oil* so as to make a bismuth emulsion. This is left in for 12 to 24 hours and then withdrawn by means of a catheter or suction syringe. Tuberculous fistulæ yield in a remarkable way to this method of treatment and sometimes as the result of several injections.

The Advantages of Pyelotomy in Renal Calculus. H. MAGRAND, Grenoble, France. *New York Medical Journal,* April 29, 1916.

For a long time it was believed that pyelotomy predisposed to the formation of a fistula, but Magrand shows by statistics that this is not so. If a fistula develops, it is due to an obstruction of the ureter. Magrand says that pyelotomy has three advantages over nephrotomy: 1. Calculi, especially the coral-shaped ones, can be more easily removed and the pelvis of the kidney can be more thoroughly explored. 2. The dangers of primary and secondary hemorrhage are less. 3. The parenchyma of the organ is not injured, lessening the danger of decreased function. According to Magrand, the latter has been not infrequently observed, both in experimental and operative nephrotomies.

Prostatectomy Under Local Anesthesia. A. E. HERTZLER, Kansas City *Journal of the American Medical Association,* April 29, 1916.

Hertzler speaks of the difficulties of the choice of anesthesia in prostatic operations. A general anesthetic may be used when the patient is in good condition, but in many of those cases in which the bladder and lung is affected it increases the hazard, hence a local anesthetic and two-stage operation come into play. When a local anesthesia fails, as it does sometimes, and it is necessary to shift to a general anesthesia, the patient suffers pain and those patients bear the change badly. While he recommends local anesthesia only guardedly in prostatectomy in his recent book on local anesthesia, he has been working out a combined technic which he thinks should be successful. Under the local anesthesia the easiest operation is the suprapubic and the operation of election, according to his experience, is performed with a combination of sacral blocking and direct prostatic infiltration through a suprapubic wound made at the time of operation or as a preliminary operation some days before. The reason that sacral anesthesia cannot be relied on is its uncertainty. He gives the details of his technic of combined sacral and local anesthesia rather fully. All that is demanded of the sacral anesthesia is that the lifting of the prostate with the attendant traction on the paraprostatic tissues shall be possible without pain. Complete anesthesia of the sacral plexus is not necessary. The only untoward effect he has noted is the temporary anesthetization of the sciatic nerves. This is unimportant, however, in prostatic operations, for the patient is recumbent and kept so. It is only in operations in which the patient wants to go about his business at once that such results are embarrassing. He has only noticed it with novocain, and quinin and urea hydrochlorid can be used with satistion in all stages of the operation.

Laminectomies Under Local, Not Spinal Anesthesia. A. C. STRACHAUER, M.D., Minneapolis. *The Journal-Lancet,* February 15, 1916.

Laminectomies were performed successfully, absolutely painlessly, and free from shock or by-effects. The operations were practically bloodless, which in this class of work is of the greatest advantage. The writer was so impressed by the angiospastic effect of the suprarenalin that he would advise the injection of an adrenalin solution even when the laminectomy is to be performed under general anesthesia. Krause, Horsley, Cushing, Elsberg, and other neurologic surgeons all comment on the profuseness of hemorrhage in laminectomies, which is frequently so great as to necessitate the abandonment of the operation, or its performance in two stages. Shock and hemorrhage are the causes of death in laminectomy, and both factors are reduced to a minimum by the plan of operation, as outlined.

Local anesthesia is not to be employed promiscuously. Scrupulous attention to details in both the preparation and the employment of anesthetic solutions is essential to success and to the avoidance of disaster. The operator using local anesthesia must be qualified to know its technic, indications and limitations, in this regard sharing the technical experience of surgery in general.

The writer prefers general anesthesia in major surgery, but believes that there is a large field in which local anesthesia is infinitely superior, and is indicated.

Spina Bifida in the New-Born. JAMES A. HARRAR, *Bulletin of the Lying-in Hospital,* New York, April, 1916.

Of 91,600 confinements in the Lying-in Hospital at or near term, spina bifida occurred 59 times. As 9 cases were sent in from various outside sources for operation, the total number reported is 68 cases. Harrar's experience with this class of new-born infants makes him predicate a very dismal prognosis as to useful function and as to life. The great majority have died within the first few weeks of life from a progressive hydrocephalus. Thirty were treated without operation. Of these all but one, a simple meningocele, died within a few weeks. Of 31 cases which were operated upon for radical cure of the rachocele 18 died within from one to twenty-one days of meningitis, encephalitis and general infection. While in 13 cases there was a successful solid scar, 9 of these died within a period of one to eight weeks from increasing hydrocephalus. The remaining four were discharged, but Harrar observes that it is doubtful whether they are still living. The associated congenital abnormalities, chiefly hydrocephalus, spastic and complete flaccid paralysis of the legs, talipes equinus, sphincter paralysis, imperforated anus, iniencephaly, gastroschisis and anencephaly complicate the prognosis seriously.

The contraindications to operation for this condition are: 1. Demonstrable evidence of hydrocephalus. 2. Paralysis of legs or sphincters (except of the slightest degree). 3. The defect so extensive as to preclude securing of good flaps without tension.

The Surgical Significance and Operative Treatment of Enlarged and Varicose Veins of the Spinal Cord. C. A. ELSBERG, New York. *American Journal of Medical Sciences,* May, 1916.

In a series of 130 laminectomies Elsberg found in six instances one or several enlarged veins on the posterior surface of the cord. All of the patients had the signs and symptoms of a level lesion and the greatest or only enlargement of the vein was found at the part of the cord which corresponded with the symptoms. Two of the patients suffered from root pains. In all of the patients the left posterior spinal vein was enlarged. Whether the enlargement was primary or secondary to some disease of the cord, Elsberg cannot say with certainty. In all instances Elsberg ligated and removed as much of the enlargement as possible. In two patients the condition was unchanged after operation. One patient, who had a tuberculoma of the cord, improved greatly, but the improvement may have been due to the removal of the tuberculoma. One patient with severe root pains was entirely relieved. Two patients with cord symptoms improved markedly; one of the patients completely.

Open-Air Treatment in Surgery. J. W. MARKOE, *Bulletin of the Lying-in Hospital,* New York, April, 1916.

Markoe advocates open-air treatment of septic cases, operated or unoperated, and also of desperate obstetric cases to tide them over their acute crisis. In a number of cases by placing such patients on the roof with enforced feeding and hematinics he has succeeded in improving their resistance, and in increasing the hemoglobin index to such a degree as to be able to carry them through very serious complications. The method of Rollier, that is of gradual and systematic exposure of various parts of the body to the actinic rays, is the one employed.

A Plea for Open Wound Treatment. (*Für die offene Wundbehandlung.*) C. V. WILD, *Muenchener Medizinische Wochenschrift,* February 29, 1916.

The method of open treatment of wounds is an old one, yet it has not been systematically carried out. V. Wild, who recommended this method at the outbreak of the present European war, is now more firmly convinced than ever of the great value of the open method of treating wounds. The advantages are, the avoidance of motion of limbs and of joints; the avoidance and economy of changing bandages with the attendant secondary infections; the doing away with stagnation and retention and the foul odors in the military hospitals. Surface wounds are not permitted to lie in horizontal posture; they are elevated so that the secretions may gravitate downward; gauze is so placed below the lower wound margin as to catch the secretions, and may be changed as often as necessary without touching the wound. Wound cavities should first be so split up as to facilitate free drainage, wide rubber or glass tubes being placed in the angles of the wound to drain off the secretions. Joint wounds are thus especially to be treated. The part is to be kept perfectly quiet and protected against trauma and against flies and contamination by a sieve-frame or aluminum splint over which a thin layer of gauze may be wound.

In joint and bone fractures splints are to be applied with fenestrations for the exposure of the wound entrance and exit and proper drainage provided.

The greatest benefit of this treatment is the comfort that comes to the patient by not disturbing him at stated intervals. In extensive injuries to bones and joints where bandages were formerly used, one is sometimes tempted to postpone changing the dressing because of the pain and discomfort to the patient. In such case the odor becomes almost intolerable. The open treatment of wounds obviates this difficulty.

A Case of Bacillus Aerogenes Capsulatus Sepsis. MEYER ROSENSOHN, *Bulletin of the Lying-in Hospital*, New York, April, 1916.

The patient was a para—1, age 29, who suffered from labor pains for five days before admission to the hospital. She came in in shock with subnormal temperature. There was almost general emphysema. Inasmuch as rupture of the lung could be excluded by physical examination the presumptive diagnosis was an infection due to the aerogenes capsulatus bacillus. Blood culture one hour prior to the patient's death proved this diagnosis to be correct. The child had been dead for some days before it was delivered by extraction. There had been a rupture of the fundus of the uterus and the child was bloated and twice the size of the average child at birth, due to the emphysematous condition.

Amputations at Base Hospitals in France. C. G. WATSON, France. *British Medical Journal*, April 1, 1916.

Watson believes that the method of choice in cases of gas bacillus infection of the limbs is the flush or flapless operation. He believes that it is a life-saving measure, because it affords adequate drainage to the infected tissues and can be performed with a minimum risk of shock. Amputations for other conditions than gas bacillus infection are rarely necessary at the base hospitals.

Autografts in Infected Fields. ARTHUR AYER LAW, M.D., Minneapolis. *The Journal-Lancet*, April 1, 1916.

From laboratory studies and from numerous cases cited the author concludes that while their exhibition in any but clean fields as a general surgical procedure is not orthodox, auto transplants, on account of their tolerance for mild infection, are not only permissible but advisable in instances of established immunity and where the need is great.

Autogenous bone grafts in infected fields parallel and act much as do cases of osteomyelitis. Part of the graft survives and proliferates, part is absorbed, and part sequestrates. The graft is itself osteogenetic and is responsible for the formation of a sequestrum and involucrum.

Gunshot Wounds of the Thorax. W. M. BOOTHBY, Boston. *Boston Medical and Surgical Journal*, March 16, 1916.

1. Intrathoracic hemorrhage is most likely to cease with the patient at absolute rest; therefore he should be kept in bed (under morphia, if necessary) at the first available station.

2. Symptoms rapidly developing, suggesting pneumonia with marked dyspnea, are probably due to the production of a large hemothorax or a pneumo-hemothorax. Such cases should be aspirated and sufficient fluid withdrawn to relieve the dyspnea. Care should be taken not to produce a negative pressure within the thorax by the use of an aspirating bottle. A simple needle with rubber tube 30 cm. long, filled with sterile water, and the open end immersed in a basin of sterile water, will produce as great a suction as it is safe to use. With such an apparatus, as much fluid can be withdrawn as will run out of its own accord.

3. After three days the danger of infection exceeds that of hemorrhage. Therefore, if the patient is not in a place equipped for diagnosing and operating for empyema, he should be evacuated to the nearest hospital so equipped, and kept there for at least two weeks before further evacuation.

4. Whenever the patient presents an irregularly elevated temperature, exploratory aspiration with a small syringe, armed with a long needle of large bore, should be performed.

5. Whenever the pleural fluid is found infected, a long thoractomy opening should be made and free drainage instituted.

6. If the patient is in a dangerous condition, prolonged search for the presence of a foreign body should be deferred. However, all foreign matter should be removed as soon as possible in order to hasten the final closing of the wound.

After Results of Tonsillectomy: A Study of 572 Cases. J. S. SIMPSON, Morristown, Pa. *Journal of the American Medical Association*, April 1, 1916.

From a study of 571 operations of removal of the tonsils and adenoids in the boys at Girard College, Philadelphia, Simpson summarizes as follows: "1. Of 320 sufferers from sore throat, 205, or 64.06 per cent., were relieved. 2. Of 571 examined, 255, or 44.75 per cent., still had tonsillar tissue present. 3. Of 195 mouth breathers, 114, or 58.46 per cent., were relieved. 4. Of 571 questioned, 400, or 70.05 per cent., felt their health to have been improved. 5. Of 48 who had diseases of the ear or impairment of hearing, 37, or 77.08 per cent., were finally relieved. 6. Of 45 studied, 25, or 55.5 per cent., gave an increase in scholarship of 4.45 per cent., while 20, or 44.5 per cent., gave an average decrease of 6.09 per cent. 7. Of 46 subject to enuresis, 25, or 54.35 per cent., ceased to offend. 8. Of 33 tested, the voices of 32 were improved. 9. One-third of the patients in a scarlet fever outbreak, and one-fourth in a diphtheria series had been operated on before the attack. One boy already operated on became a diphtheria carrier."

Blood Changes Following Mesothoriumirradiation. (*Veränderungen am Blute nach Mesothoriumbehandlung.*) BERNHARD SCHWEITZER, *Münchener, Medizinische Wochenschrift*, March 7, 1916.

The erythrocytes are practically unaffected by deep-ray-therapy with mesothorium, nor is the hemoglobin directly influenced. Indirectly through the inhibitory action upon the cancer the hemoglobin and red blood cells are increased. There is an initial rise in the number of leucocytes, which, however, is of very short duration. This is followed by a definite leucopenia which affects the lymphocytes as well as the neutrophiles. The lymphocytes do not participate in the initial leucocytosis. Some eight weeks after the last mesothorium treatment the number of leucocytes approaches the normal count.

Schweitzer remarks that inasmuch as the neutrophiles are the phagocytes and as such the carriers of antitoxins and bactericidal substances, the body must miss these defensive agencies in case of systemic infection. Hence this must be considered in treatment by mesothorium. Bone-marrow is also injured by the mesothorium. The "Röntgenkate," in his opinion, may be due to the deleterious effect on the blood itself.

The Treatment of Joint Rheumatism by Intravenous Injection of Collargol. DR. WICK, *Muenchener Medizinische Wochenschrift*, No. 10, March 7, 1916.

Wick reports a case of simultaneous knee and foot rheumatism in a patient who had besides rheumatic symptoms in the back and loin. Three injections of 2 c.c. of 2 per cent. collargol into the median cubital vein were made at intervals of 3 days. There followed upon each injection a chill and elevation of temperature. This lasted only a few hours and was soon replaced by decided improvement in the local symptoms. The second injection was followed by a less severe reaction than the first, and the third injection by a very mild general reaction. Within twelve days the patient was able to use his limb without difficulty and without pain.

The author encourages others to try this method of treatment, as in his opinion it might prove of value in obstinate cases.